THE AMERICAN
School Board Journal

A PERIODICAL OF SCHOOL ADMINISTRATION

Devoted to the Interests of School Boards, Superintendents,
School-Business Officials, and School Architects

VOLUME 88
JANUARY—JUNE, 1934

THE BRUCE PUBLISHING COMPANY
NEW YORK - MILWAUKEE - CHICAGO

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THE AMERICAN School Board Journal

A PERIODICAL OF SCHOOL ADMINISTRATION

JANUARY 1934

34th ANNUAL SCHOOL BUILDING NUMBER

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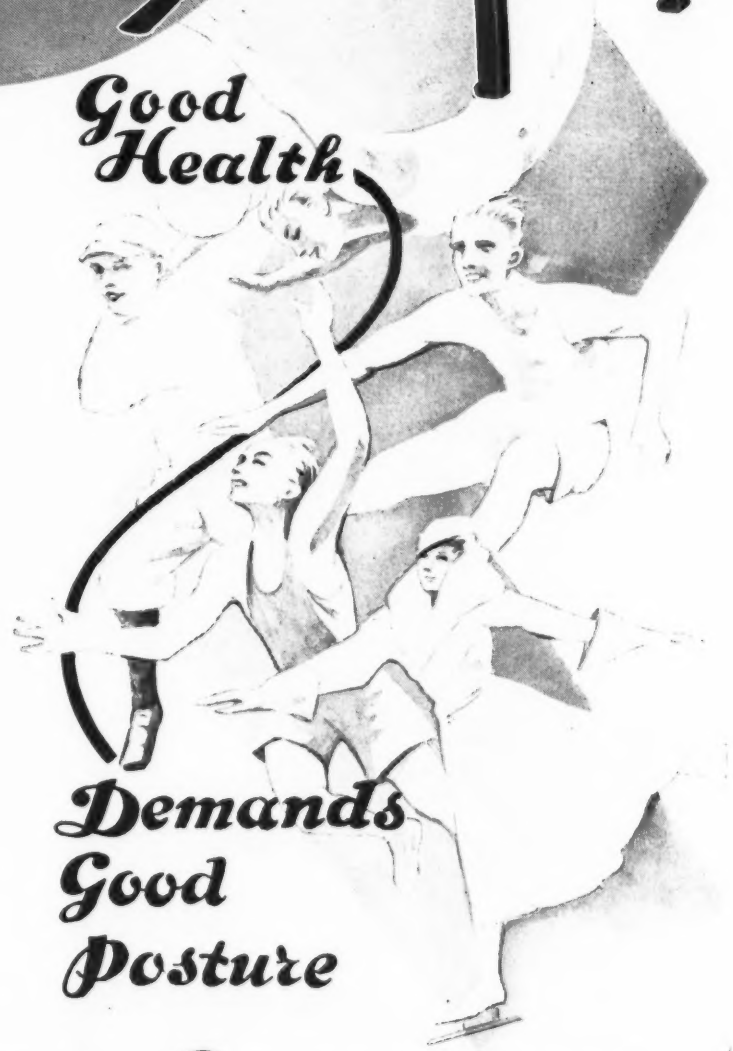

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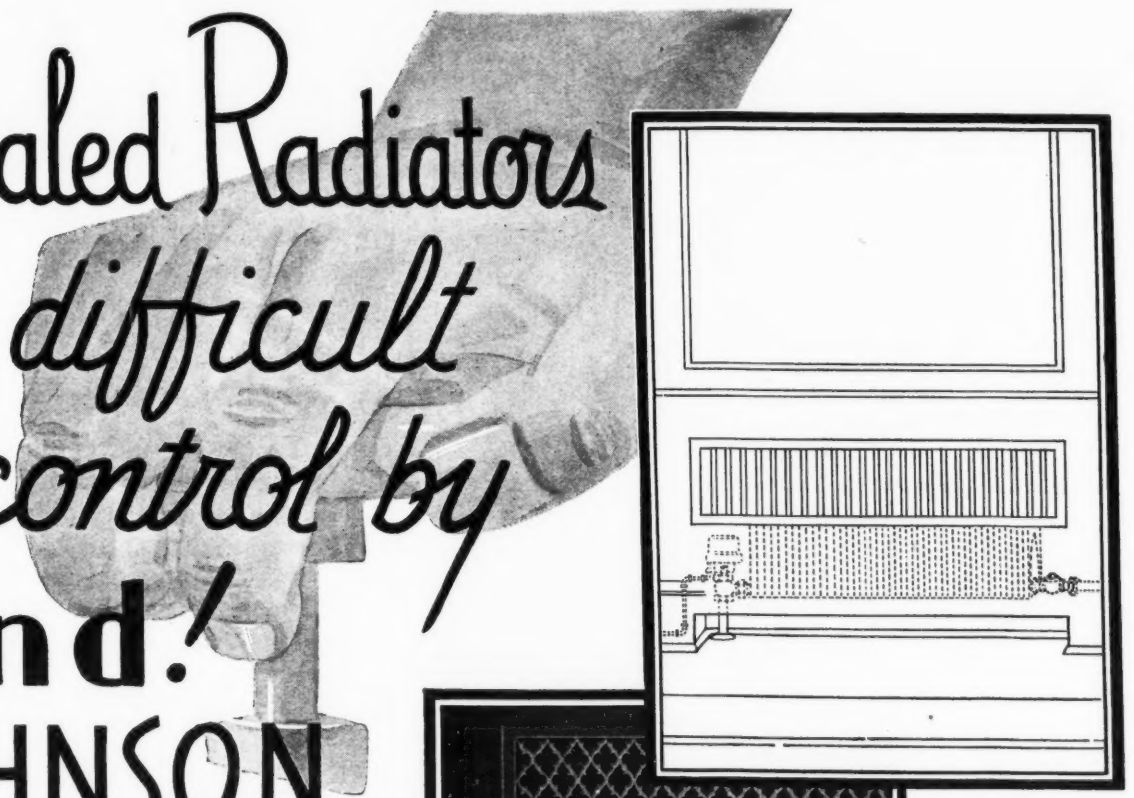

Above: A concealed radiator within the wall shown in "phantom," with Johnson heat control valve.

At left: A cabinet hides the "standing radiator" with Johnson valve on steam supply.

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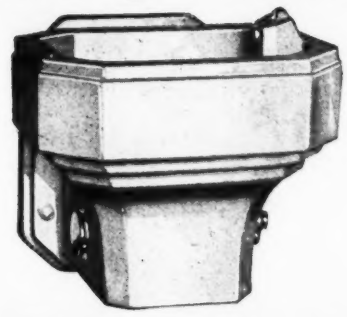
FOR  YOUR

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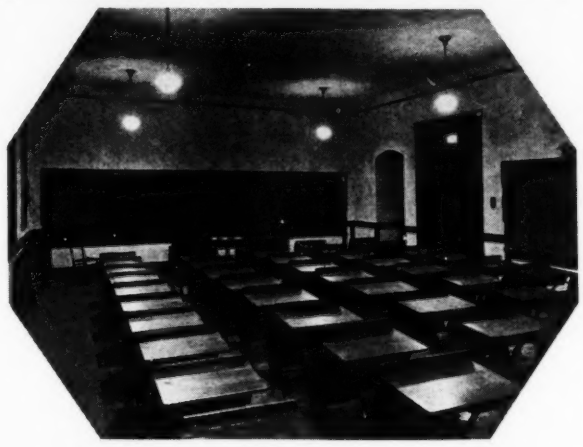

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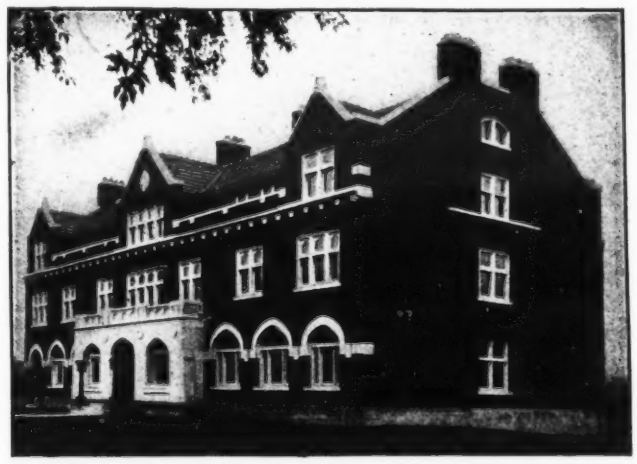

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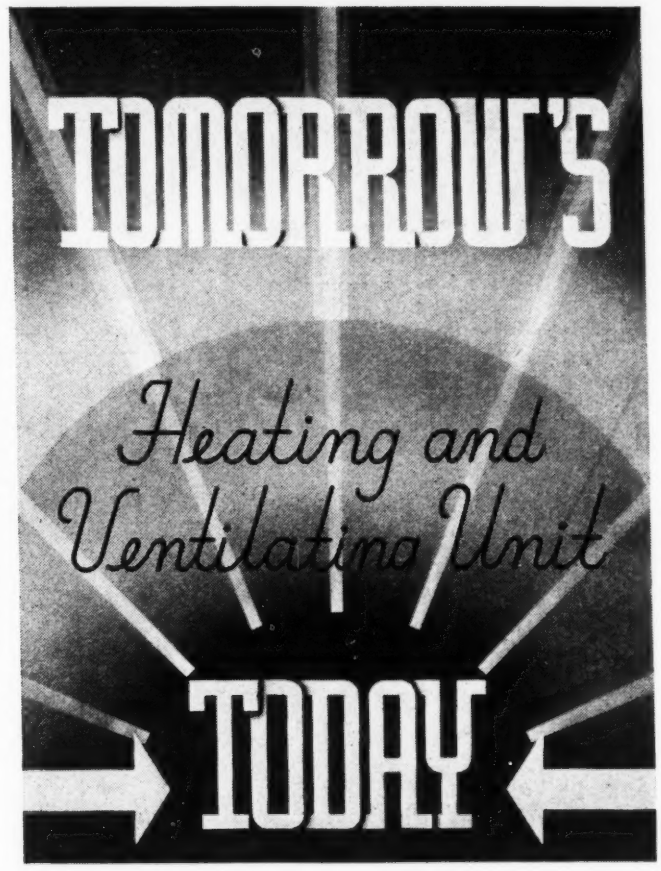

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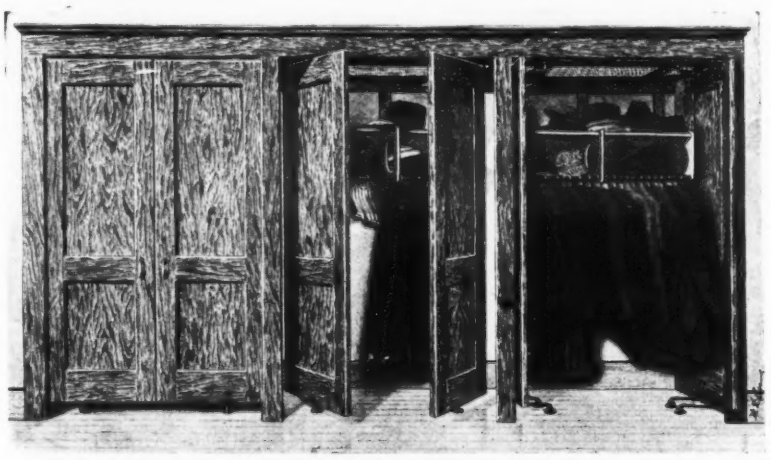

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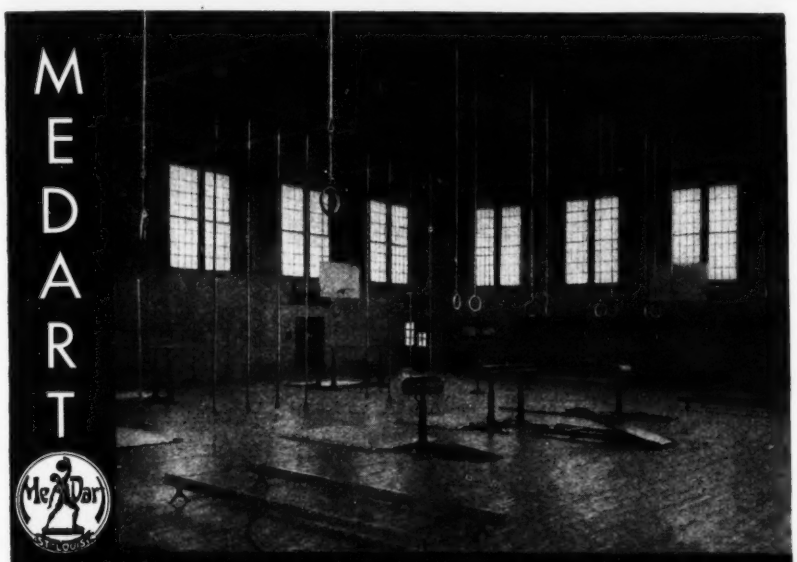

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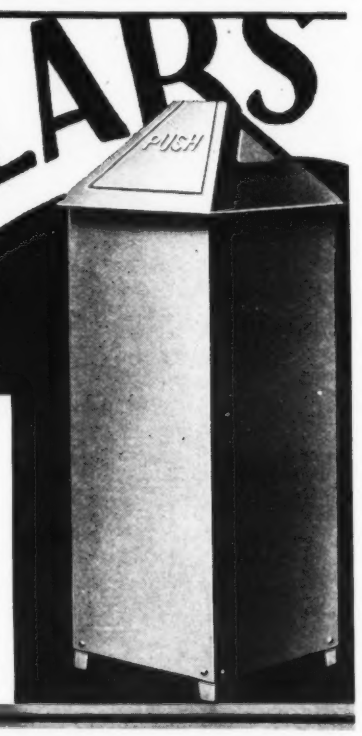

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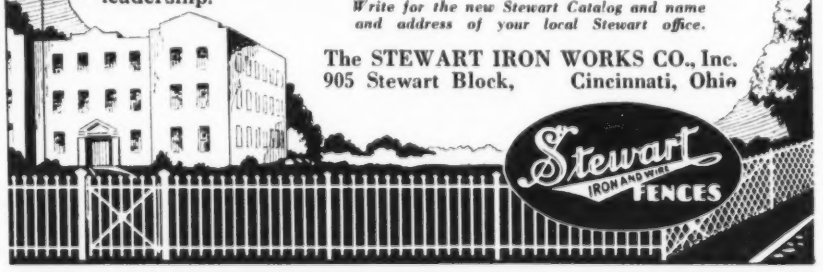

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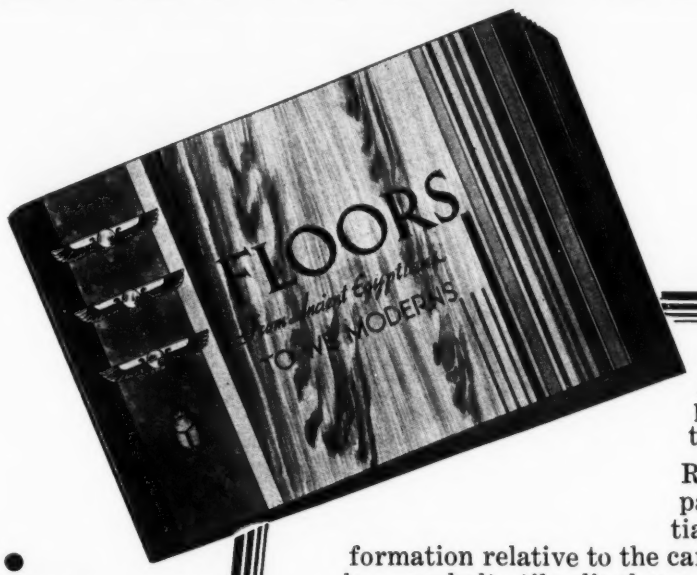

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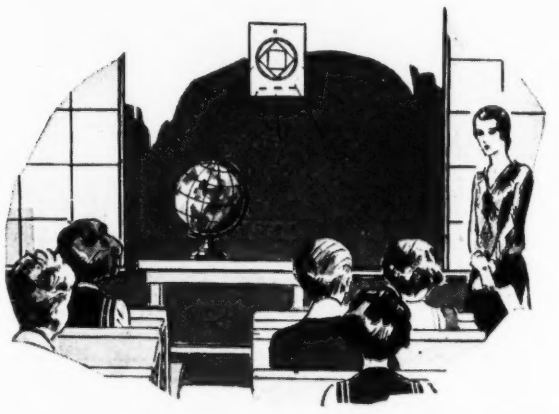

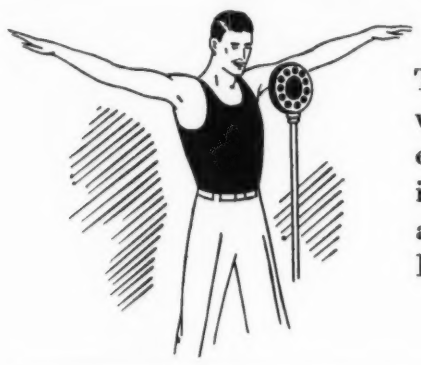

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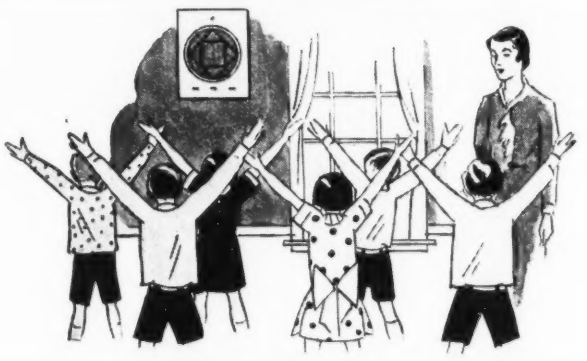

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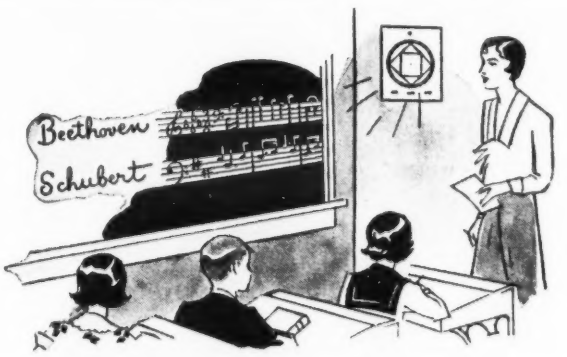

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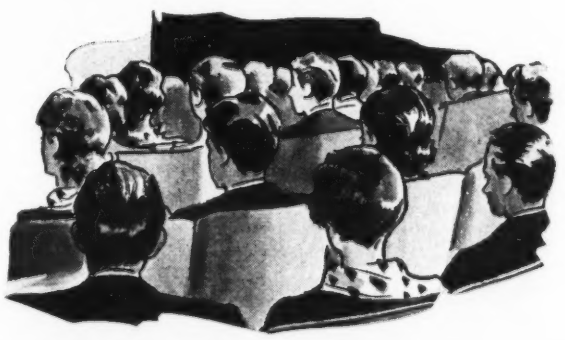

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VOL. 88
No. 1

THE AMERICAN School Board Journal

JANUARY,
1934

A Periodical of School Administration

Eastern Office:
40 EAST 34TH STREET
NEW YORK, N. Y.

Published on the first day of the month by
THE BRUCE PUBLISHING COMPANY
524–544 No. Milwaukee Street, Milwaukee, Wis.

Western Office:
66 E. SOUTH WATER STREET
CHICAGO, ILL.

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NEW DEAL— NEW YEAR

THE past year has been one of transition and change from an old to a new order of things. The old will be consigned to the ash heap of time. The new is before us.

The coming year is one in which the New Deal will come into effective play. It will involve new approaches, new conceptions, and new experiences.

Will it exert the beneficient results promised for it? Will the economic structure be righted? Will the concept of social justice be realized? Will there be a fairer adjustment between producer and consumer? Will the New Deal work?

The schools are vitally concerned. They have felt the economic disturbances in unmistakable ways. They are subject to the economic pulsations of the nation. They, too, have been obliged to plan and adjust for a new order of things.

What is the answer to the one great question, which lingers in every thoughtful mind? Can it be answered in the affirmative? Those who realize the natural resources of the country, its enterprise, energy, and constructive ability, and finally that genius which has always characterized the American people, will look forward with confidence and assurance.

As far as the school interests are concerned much has already been accomplished. The National Recovery Act has appropriated millions of dollars for new school buildings. Millions more are being expended through the Civil Works Administration for repairs and rehabilitation of school property. The importance of supporting the schools of the nation will not be overlooked.

THE EDITOR

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Subscriptions—In the United States and possessions, $3.00 per year. In Canada, $3.50. In foreign countries, $4.00. Single copies, not more than three months old, 35 cents; more than three months old, 50 cents. Sample copies, 35 cents.

Discontinuance—Notice of discontinuance of subscriptions must reach the Publication Office in Milwaukee, at least fifteen days before date of expiration. Notice of changes of address should invariably include the old as well as the new address. Complaints of nonreceipt of subscribers' copies cannot be honored unless made within fifteen days after date of issue.

Editorial Material—Manuscripts and photographs bearing on school administration, superintendence, school architecture, and related topics are solicited and will be paid for upon publication. Contributions should be mailed to Milwaukee direct, and should be accompanied by stamps for return, if unavailable. Open letters to the editor must in all cases contain the name and address of the writer, not necessarily for publication, but as evidence of good faith.

The contents of this issue are listed in the *Education Index*. Member, Audit Bureau of Circulation and Associated Business Papers.

Are Your Schools Equipped

Safely and Adequately for the big enrollment of 1934

With the depression pinch gradually passing off it is time to check over requirements carefully and make plans for important repairs or replacements.

There are some expenditures which can be made that involve practically no construction changes and yet accomplish wonderful results — often returning many times the original cost in the saving of teacher and administration time cost to say nothing of improved efficiency or safety secured.

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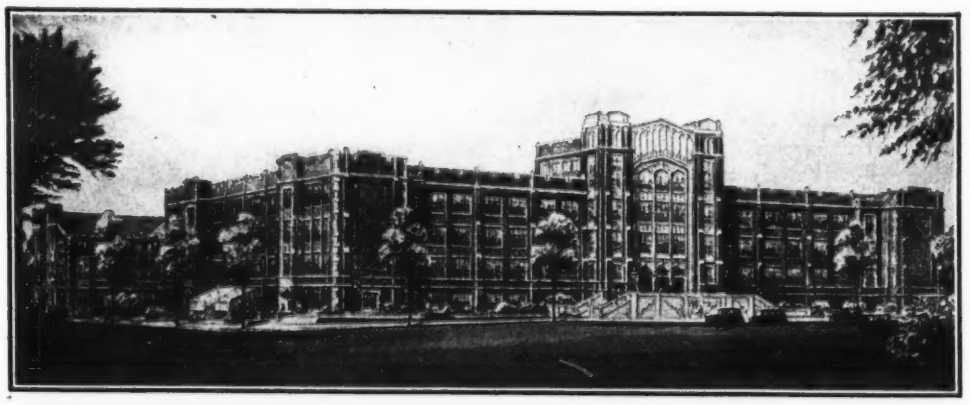

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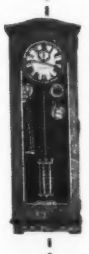

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THE AMERICAN
School Board Journal

Volume 88, No. 1 JANUARY, 1934 Subscription, $3.00 the Year

The SELECTION of School Sites

Dr. George W. Gerwig, Pittsburgh, Pa.

If I were asked to condense into one sentence the experience of over forty years in schoolwork I would modify the Biblical phrase and reply: "With all your getting, get land!"

This is not said from a mistaken idea of values. The prime purpose of all education, of course, is the development of the child for his own good and the protection of the state. In attaining this goal the steps are the teacher, the course of study and books, the building, the equipment, and the land. But in providing these the order is usually the reverse. Land is first obtained, then buildings, equipment, course of study, books, and the teacher.

What gives the statement significance is that if sufficient land is provided all the other steps become possible. The converse is tragically true. If adequate land is not provided in the beginning or while it is still available, it can either never be provided or can only be secured at prohibitive cost. This is peculiarly true of cities. A cow-path plan, like that of Boston, will inevitably result in cow-path streets. And an old city, like an old person, is difficult, if not impossible, to change.

The ideal procedure is to plan in the beginning for the common needs of all the members of the community. If provision is first made for all the civic needs, for schools, recreation centers, parks, streets, then the homes and business sections, the factories, and the transportation facilities can readily be fitted in to the general plan. But when a community begins like Boston did, locating homes at random along narrow, crooked bypaths, the destiny of the place is fixed. Future changes become too costly to be practicable.

For years I have told friends and school officials who visited Pittsburgh from other places to get down on their marrowbones when they got back home to the plains or prairies and thank Heaven for the abundance of level land. I have always said that I would die happy if I might once secure for the children and the schools a ten-acre field of level land, similar to literally millions of plots all over the country, and build a good school in the center, with a playground on one side and a park on the other!

The school is the best place to learn the best way of doing the best things. The world is now studying values as never before. Human values are increasingly recognized as superior values. The most effective approach to human values is through the school, increasingly recognized as America's most successful welfare institution.

The First Requirement

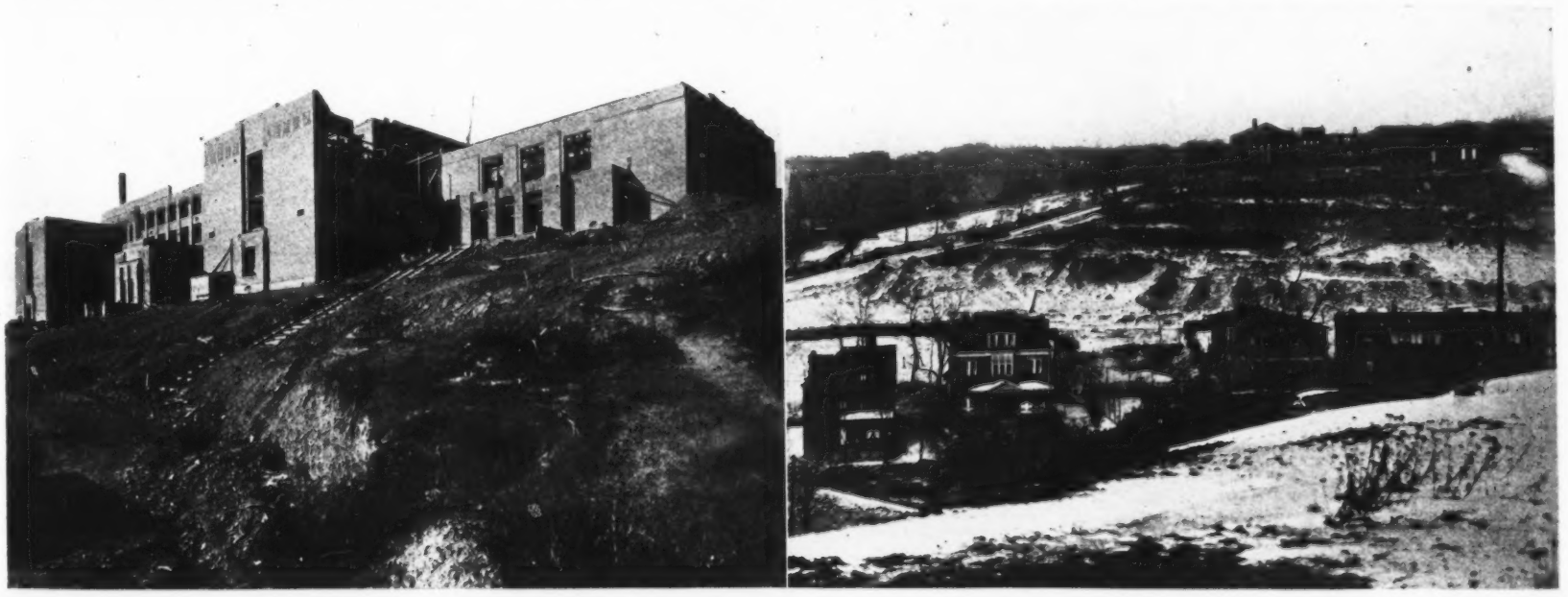
The first requirement for a good modern school is sufficient land within easy reach of the children it is to serve. The distance should be adjusted to the length of the children's legs. Elementary schools should be within easy walking distance of small children. Junior high schools may be a little farther away, each serving a group of elementary schools. Senior high schools may be still more distant, each again serving a group of junior high schools.

This first requirement, of sufficient land, is easy for the country, but becomes increasingly difficult as the size of the community increases. The community that fails to plan for and provide sufficient space for its schools in the beginning, or to wisely have faith in and make provision for future growth, lays up for itself an inevitable consequence of either burdensome costs or of crippling limitations. And a community that either deliberately or thoughtlessly fails to provide adequate land for its needs, cripples the best growth of its children and impoverishes its richest asset.

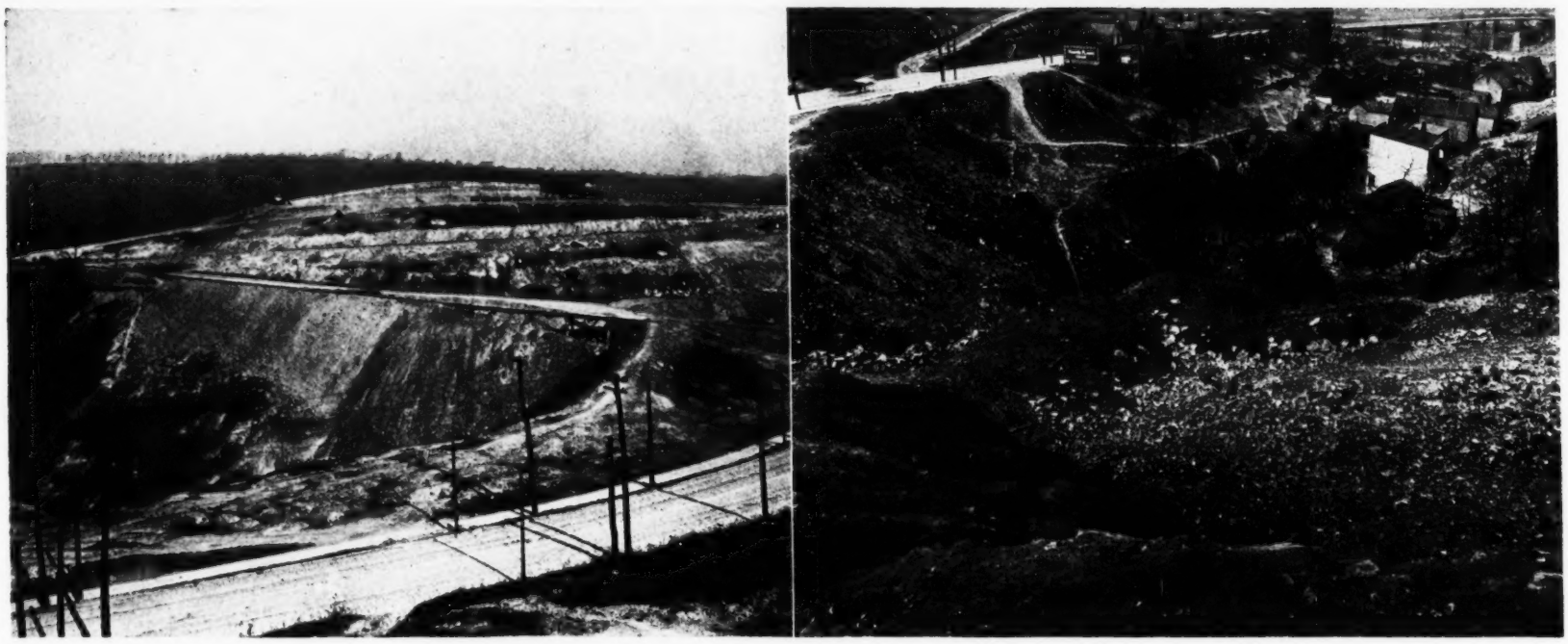
The open country, especially all the prairie country, still has abundant land satisfactory for school sites. In the cities, especially as they grow older, the difficulties constantly multiply. Usually, if plans of lots or additions are laid out without provision for schools, recreation centers, parks, or boulevards, streets and alleys are located without sufficient space between them for adequate school sites. In many such places the purchase of a single lot gives the owner an equity in every street and alley in the entire plan. So no street or alley can be abandoned ever, for the location of a school which is found to be necessary when homes have been built and children are ready for school, without the unanimous consent of every lot owner, his heirs or administrators. This it is manifestly impossible to secure.

In Pittsburgh a similar section grew up on practically the only level ground in the city limits, surrounding the great Westinghouse factories. When it at length became necessary to provide a high school, which now has 3,000 children in it, it was found absolutely impossible to buy sufficient land without going entirely off center. So during all the centuries in which that school will stand and serve its children, each one of a majority of them will be obliged to travel an improper distance to and from school.

The location of railroads, factories, main highways, especially in these days of dangerous traffic, all will interfere with the real rights of

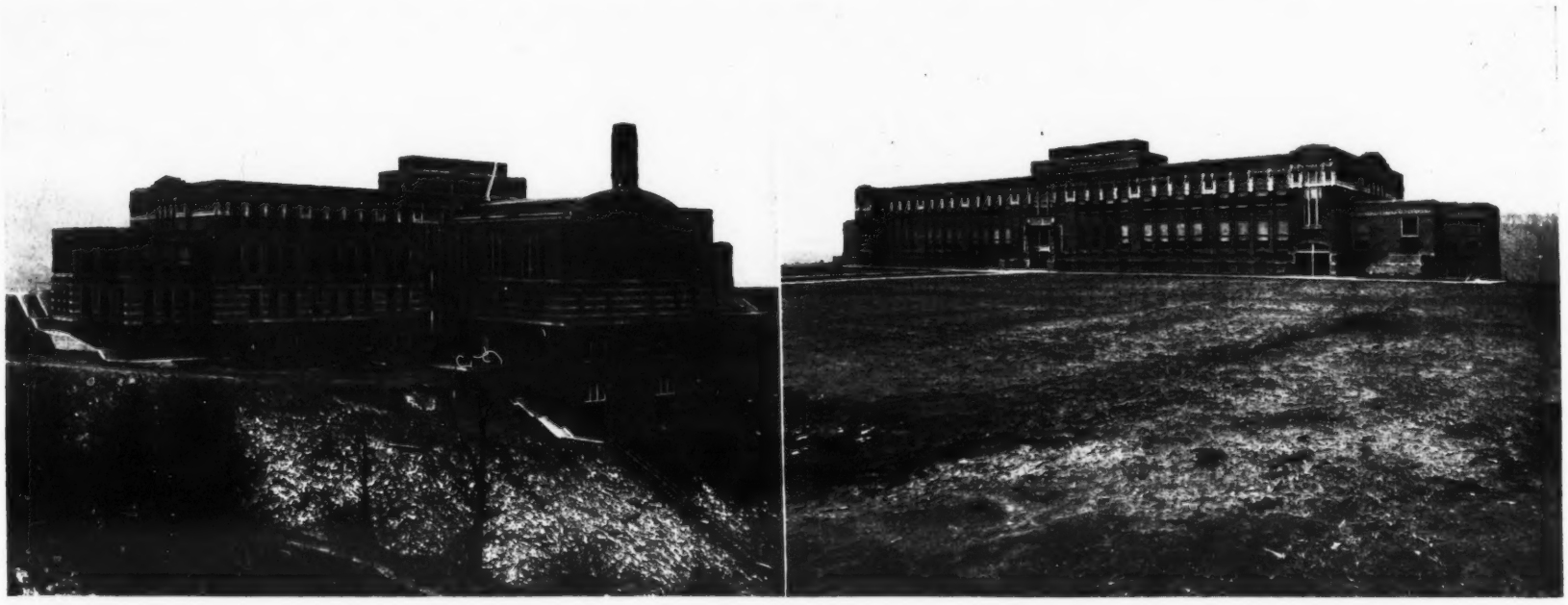


THE HERRON HILL HIGH SCHOOL SITE, PITTSBURGH, PENNSYLVANIA, MAKES CLEAR THE DIFFICULTY OF LOCATING SCHOOL BUILDINGS IN A HILLY CITY.
The illustration at the left is the front of the building shortly before its completion; the illustration at the right is the site shortly after grading operations had been begun.



THE DEVELOPMENT OF AN ELEMENTARY-SCHOOL SITE IN A HILLY COMMUNITY: THE GREENFIELD SCHOOL, PITTSBURGH, PENNSYLVANIA

Upper Left: The grade school site in November, 1916, shortly after the grading operations had been begun.
Lower Left: The building upon its completion. The sodding of the hillside has not yet been completed.
Upper Right: A view of the site from the top of the hill.
Lower Right: The playground, which is the only level spot within a mile of the school.



the children unless these rights are properly protected by adequate foresight. If or when it becomes necessary to buy previously constructed buildings in order to secure absolutely necessary school space, these buildings suddenly acquire exorbitant values in the eyes of their owners. The problem of getting them, either by purchase or by condemnation at anything like a fair price becomes unspeakably difficult. And when acquired they are often worse than a total loss, for it often costs more to tear them down and remove them than the material in them is worth.

The average impatient American citizen does not realize that European cities have often been built, torn down, and rebuilt time after time, through the centuries. But this has usually been done by an autocrat, like Napoleon when he laid out the boulevards of Paris, regardless of the rights or the imagined rights of small owners. While most school districts have the right to take property by condemnation for school purposes the process is both expensive and unsatisfactory.

The Best Procedure

When this does become necessary, the best procedure is for the school board to quietly, and well in advance if possible, determine the needs. Then secure options on the property desired. Then have it appraised by a group of disinterested experts. If the price the owner asks for the property happens to be less than that fixed by the disinterested experts, which may happen once in a blue moon, simply buy it. If, on the other hand, as usually happens, the owner asks more than the appraisal, the board should offer first the amount of the appraisal. If that fails, offer this amount, plus what condemnation would cost. If this also fails, the only alternative is to take the property by condemnation, and let the court settle the amount to be paid.

If a school board is far-sighted enough to anticipate the needs, then to get an offer, and if necessary an appraisal, they may well bide their time until such a day as the owner will yield to the lure of what is usually spot cash and accept a fair price.

It is one of life's major ironies that there should ever be need either of land or of funds for schools, especially in all that part of America made up of the original Northwest Territory. When our forefathers decreed that Sections Nos. 16 and 36 in every township should be set aside for school purposes in every state carved out of this great Northwest Territory, they were wise beyond their day and generation. The potential school fund thus created was not only an assurance for the education of future freemen but also the shrewdest method yet devised for financing that education. Most of the states, however, were prodigal with their inheritance and sold their school lands for a pittance. A very few of the states are now wise enough to re-create and rebuild their educational funds by reforesting and other methods.

A few communities are beginning to realize that land held for the needs of all, is one of the finest types of treasury stock. There is an old and true saying that vacant lots soon eat their heads off. This, however, though true of private land, is not true of publicly held land because the taxes and to a large extent the interest do not have to be paid on public property.

The Penalty

The penalty for neglect of proper advance planning comes swift and sure. Of course it is difficult to determine in advance the character and direction of a new community's growth. Lincoln, Nebraska, may be taken as an example of a growing prairie town. It might have grown toward any point of the compass. For a while every indication pointed toward a growth to the north. The final growth, however, was southeast. There is very seldom loss, however, on land held by the community, and often great and proper gain, through, in this case, an earned instead of an unearned increment, resulting from the thrift of all the people, and use for the benefit of all the people.

Some of the larger cities have had most distressing experiences in their belated effort to provide adequate school facilities. In New York it is almost impossible to secure ground for schools in congested sections. As a consequence mammoth school buildings are a necessity, with playgrounds on the roof, and sometimes with

double and even triple sessions. In one section of New York there is a schoolhouse accommodating six thousand children. Within a block and a half in one direction is another school with two thousand pupils, and within the same distance in the opposite direction another school building with two thousand pupils, a total of ten thousand school children within a radius of one and one-half city blocks. The school population of New York has been growing at the rate of forty thousand children each year for a number of years. The Washington Irving High School at Seventeenth Street and Irving Place was built originally to accommodate two thousand girls at a single session. At one time it was struggling heroically with the task of accommodating six thousand girls, in triple sessions. Of these, each one was a potential Mary Antin, perhaps capable, if given a whole chance, of developing untold latent possibilities, and making rich contributions to The Promised Land. Smaller communities should take heart at the magnificent manner in which New York has attacked and partially solved the problem of providing schools, and especially high schools for her children.

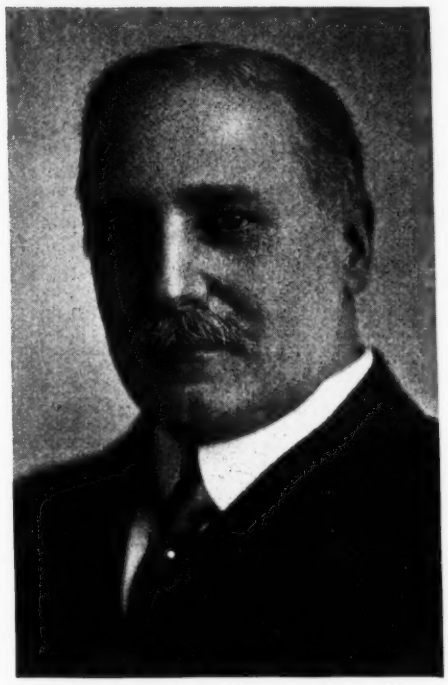
There is a great difference between cities in the difficulty of securing adequate ground for schools. Pittsburgh, for example, was obliged to pay $50,000 an acre for four acres upon which to erect the Schenley High school, the first of over twenty modern high-school buildings. The building itself covered practically all the available ground, leaving no possible opportunity for recreation grounds immediately adjoining. So an additional ten acres, on a hilltop, half a mile away, had to be bought at $6,000 an acre.

Most other cities are more fortunate in having level land available for school purposes at moderate prices. Cleveland, for example, purchased an ideal level spot of twelve acres in a choice residence section for $50,000. St. Louis purchased a similarly well-located site for a high school consisting of eight acres for $60,000. Cincinnati was most fortunate in securing ample acreage at a price which will make it one of the best investments the city ever made.

The value to a community of land set aside specifically for school purposes is now generally recognized. A wisely chosen location not only increases in its own value but causes an increase in value in the neighborhood. The value of new houses, built following the erection of a modern school building, soon pays the cost of the school. Americans will build or buy homes where there are good schools. They will not buy or build where there are not good schools.

Three Outstanding Facts

Three facts are outstanding, following the recent debauch of war prosperity and its more recent backwash. The first is that the money put into schools during that period has been the best investment the community made, and sometimes the only good investment. While paper profits have vanished, the schools, usually built at far less than their present replacement value, have proved themselves to be A-1 assets. The second is that, while other plants have been idle, there has been a universal need and demand for more and better school service, with schools everywhere running at full capacity, excepting where through bad management there was a shortage of salary funds. The third is that, while most other investments have fallen in value, cutting dividends, or passing them altogether, the schools are going right on paying full and often extra dividends.



DR. GEORGE W. GERWIG
Secretary-Treasurer, Henry C. Frick Educational Commission, Pittsburgh, Pennsylvania.

The lesson of the advantage of confidence and foresight, sometimes learned through bitter experience by the cities, may be used to advantage by the country. It is an old saying that the country makes men and the city mars them. Luther Burbank said that the third generation of city-bred people usually comes to grief. We must somehow retain for our city-born children the strength of body, the cleanness and clearness of mind, and the soundness of nerves which were characteristic of the products of the Little Red Schoolhouse.

The Battleship of Democracy

The school is the Temple of Democracy. The schoolhouse is the Battleship of Democracy. A modern steel battleship costs as much as a thousand grade schools, as much as a hundred moderate-sized high schools, as much as ten great city high schools of the first class. The battleship will be obsolete in ten years and may be blown up any minute. The schools will serve for a century.

Let us take to ourselves, then, these specifications for Schools with a Perfect Score:

1. Ample ground for exercise and joyous play.
2. Buildings simple, but stately.
3. Teachers who love children with a parent's love; who find joy in service.
4. A course of study contributing to a strong, healthy body; an alert, sure mind; a fine, steadfast spirit.
5. Those things in art or craft which develop to the full the abilities latent in each one.
6. A training which leads from learning and doing on to wisdom, to high ideals, to service as a sacred trust, to worthy citizenship, to character.
7. Having given these things to the children, extend through them to all citizens an exalted, neighborly life more abundant, making the Big Red Schoolhouse a radiating center, for the final good of all Americans, and then for the world.

THE SCHOOL ASPECTS OF PUBLIC WORKS ADMINISTRATION

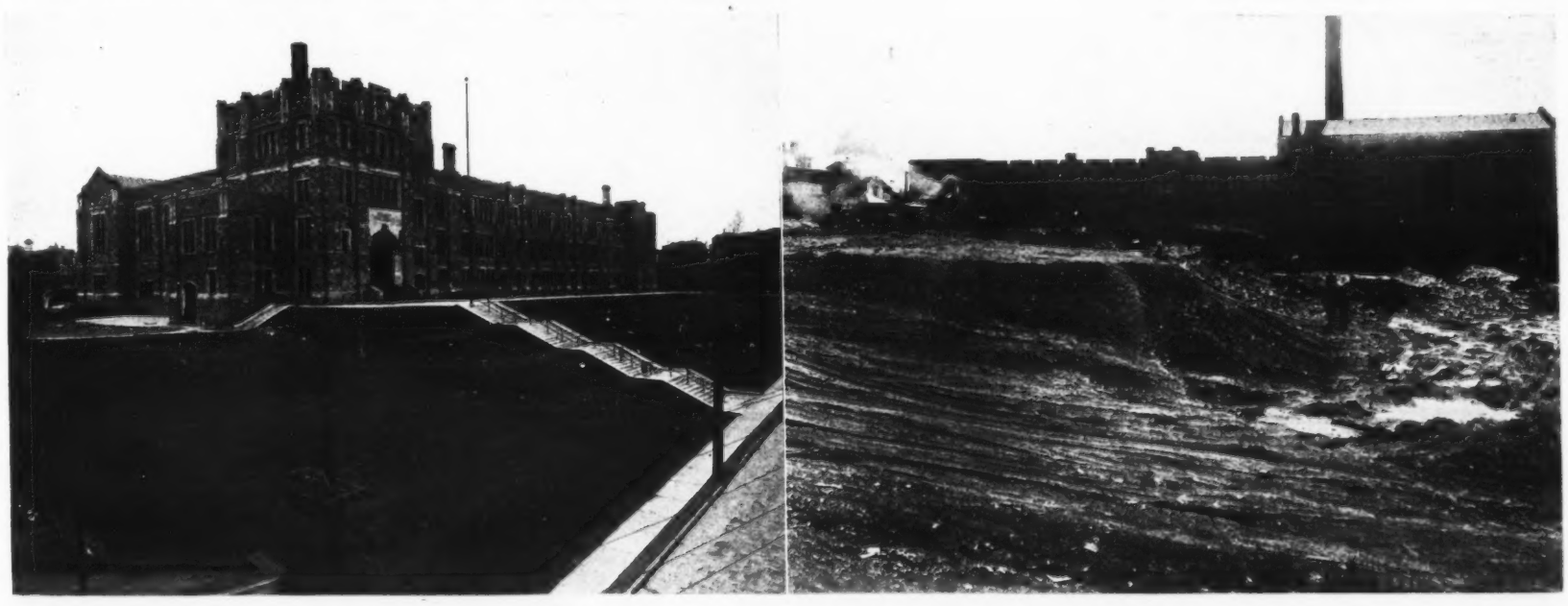
H. M. Goldberg, Philadelphia, Pennsylvania

Six months have elapsed since the inception of the public works administration as a medium of restoring some degree of normalcy to the construction industry and to return to the field of production employment millions of idle Americans. To say that this enterprise has been eminently successful would be putting it mildly. It is beyond question one of the greatest successes of the administration in its ministering of its "new deal." Already many hundreds of thousands of men have been put to work and numerous worthy public projects have been started to better serve the populace of today and the generations of the future.

It has given the stimulation for encouragement, hope and actual realization of plans of many, where but several months ago nothing but despair, discouragement, and inactivity were the order of things. One has only to visit the offices of architects specializing in schoolhouse construction to realize that soon there will be considerable business available for those whose efforts and applications have made them worthy to obtain. Several school projects sponsored by the PWA have already gotten under way. Many will follow shortly.

The writer, in company with many people, viewed the entrance of the Federal Government

(Concluded on Page 59)



A SUCCESSFUL SOLUTION OF THE PROBLEM OF A SCHOOL SITE IN A HILLY COMMUNITY
The front of the Langley High School, Pittsburgh, and the rear of the building. The operations at the rear involve the removal of a "hump" and the raising of a low spot to produce a level playground.

Time Required for *Architectural Development* of School-Building Plans and for *Construction* of the Building

N. L. Engelhardt, Professor of Education, Teachers College, Columbia University

School architects frequently report that not sufficient time is allowed for the completion of the various steps of the work required of them. To ascertain the amount of time spent in the various steps of planning, a blank form was sent out to 200 architects asking for data, as follows, on buildings which they had recently planned: the type of school, the date of selection as architect, the date set by the board of education for the completion of preliminary drawings, the actual date of approval of preliminary drawings, the date of approval of final working drawings, the date of award of building contracts, the date of acceptance of building, and the approximate total cost of the building.

Returns were secured on 80 buildings. These buildings were scattered geographically as follows: 32 in the eastern states, 8 in the southern states, 12 in the Great Lakes region, 13 in the Great Plains, and 15 in the western states. Twenty-two of the buildings cost $300,000 or more, 27 cost $100,001 to $300,000, and 31 cost under $100,000.

To the question, "Was time sufficient for efficient service on preliminary drawings?" the answer "yes" was reported in the case of 42 buildings. On three buildings "no" was reported to this question. For 27 buildings, architects left this question unanswered, and one architect wrote "barely" and another wrote "more than sufficient time" as their answers. In four cases, the annotation was "had all the time necessary." In three other cases, the remark was "I just get out my plans as soon as they can be completed."

Clear Statement by One Architect of the Time Required

One architect replied that the blank form requesting dates was difficult to fill out with exactness. His letter continues as follows:

"In our experience, boards of education seldom set a definite date for the completion of either preliminary or final drawings. The preparation of preliminary drawings is often a matter of weeks or even months, depending upon whether the early studies go through without extensive changes or not. Often board members express a wish to see the sketches worked out in some other style of architecture than originally proposed. The state department often holds up their approval of the preliminary drawings until all their various divisions can look them over and criticize them. All these factors prevent a definite date being fixed at the start of the work for the completion of preliminary drawings.

"In the preparation of working drawings, it is possible to work to a closer schedule depending upon the size and complexity of the building, the amount of work in the office at the time, and the amount of changes that are often desired by the superintendent of schools or the board of education as the work proceeds.

"Generally two to three months should be allotted for the preparation of working drawings on the average building, and still longer time for the more complex structures.

"The date of acceptance of the building is very hard to determine exactly, as boards often take possession and use a portion of the completed structure before the entire building is ready, so that there is no formal date of acceptance."

Comments on Time Restrictions as Recorded by Other Architects

In submitting their data on the time required for the completion of the various steps in the development of specific buildings, other architects made the following comments:

"The above dates were met only by careful planning and the utmost diligence. Shorter time spent in selecting the architect and if applied to architectural study would have been better spent."

* * *

"On the above building the time for the work was too short though it was accomplished. As a result it was felt by the superintendent's department that they had not been consulted as they should have been and that their final approval had not been obtained. Due to a change in administration of the city building-inspection department, a number of changes during construction were required to comply with code provisions not previously required."

* * *

"Generally speaking, in the selection of architects school boards are influenced by pull and salesmanship. I believe, however, that after the architect is selected he can have plenty of time to prepare his drawings and if he has the board's confidence, he can do pretty much as he pleases."

* * *

"The following has been the usual procedure in this locality in planning elementary schools. At a regular monthly meeting of the school board the architect is selected. Between then and the next meeting the architect and superintendent of schools get the preliminaries into shape for the board's approval. For the next monthly meeting the working drawings and specifications are completed and approved by the board and issued for bids, so that the bids can be received and contracts awarded at the following meeting.

"Counting the meeting at which the architect is selected No. 1 there are four school-board meetings before the building construction is commenced.

"For larger buildings, two or more additional meetings are held before the same stage is arrived at. I have found this satisfactory."

* * *

"There is a tendency for school boards to give too little time for the study of their problem both in preliminary and final drawings."

* * *

"If mutual confidence between school board and architect exists, the necessary time will be allotted for the preparation of plans."

* * *

"Legal difficulties were encountered in one building. This accounts for the long time reported."

* * *

"The contractor failed, hence the increase in time spent on the job."

* * *

"For jobs the size of the above ($50,000 to $150,000) it requires from 45 to 90 days to complete the working drawings, depending on the size of the force and the completeness of the building."

* * *

"It is very rare in our experience for the owner to set a time in which preliminary sketches must be completed and approved, and it is almost impossible to state in advance the exact length of time which would be required, because in many cases preliminary sketches are made and then the project is dropped for a long period of time. When the project is taken up again, there may be additional requirements or changes which radically alter the original scheme.

"We believe that a board of education should give the architect *carte blanche* as far as time is concerned in the preparation of sketches. The preliminary planning and designing of a building constitute almost the most important part of any architect's service.

"The actual date of approval of preliminary drawings, and the final working drawings are records in the files of the boards of education, and it is very rare that we have any definite record in our files."

* * *

In other cases, the blank form was returned with the comments "have no records."

Conclusions

The experiences of architects vary considerably with respect to the "time" requirements set up by boards of education for the various steps of planning. The reports on this item fall into the following categories:

The board of education recognizes the professional character of the architect's service, re-

(Concluded on Page 56)

TABLE I. Time Allowed the Architect Between the Date of His Selection as Architect and the Date Set by the Board of Education for the Completion of Preliminary Drawings on 80 School Buildings — Elementary, Junior High, and Senior High Combined
Distributed According to the Cost of the Building

Cost of Buildings	1 Month or Less	1 to 2 Months	2 to 3 Months	3 to 4 Months	4 to 5 Months	5 to 6 Months	6 Months or More	No Time Set	No Data Available
$100,000 or Less....	11	2			2		1	3	12
$100,001 to $300,000	6	1	1		1			9	9
$300,001 or More...	2	2		1		1	1	14	1

TABLE II. Time Allowed Architects Between the Date of Their Selection as Architects and the Actual Date of Approval of Preliminary Drawings on 80 School Buildings — Elementary, Junior High, and Senior High Combined
Distributed According to the Cost of the Building

Cost of Buildings	1 Month or Less	1 to 2 Months	2 to 3 Months	3 to 4 Months	4 to 5 Months	5 to 6 Months	6 Months or More	No Data Available
$100,000 or Less.....	13	5	3			2	2	6
$100,001 to $300,000...	7	4	1		2	1		12
$300,001 or More.....	3	4	1	5		2	2	5

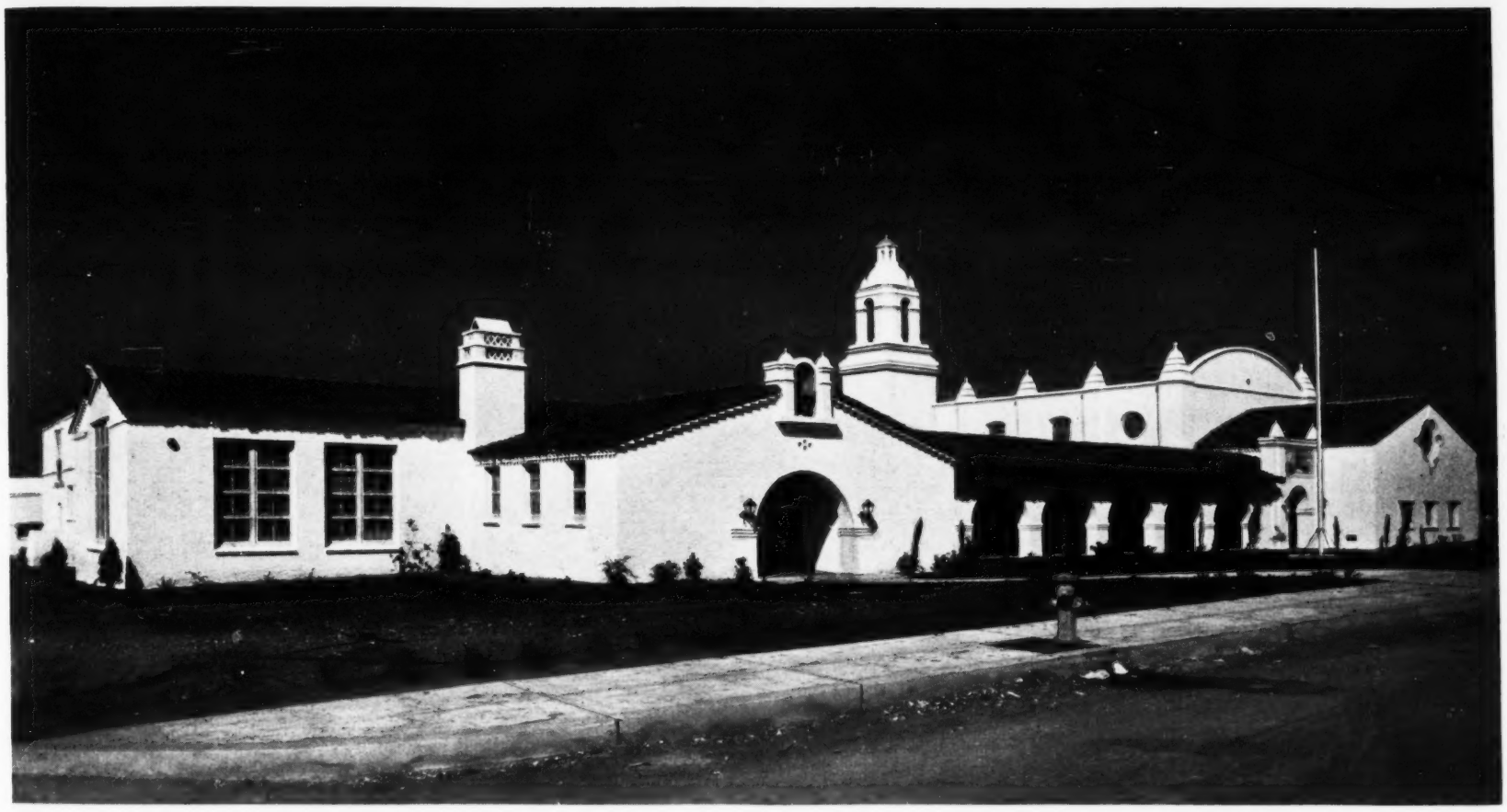
TABLE III. Time Required by Architects Between the Actual Date of Approval of Preliminary Working Drawings and the Actual Date of Approval of Final Working Drawings by the Board of Education on 80 School Buildings — Elementary, Junior High, and Senior High Combined
Distributed According to the Cost of the Building

Cost of Buildings	1 Month or Less	1 to 2 Months	2 to 3 Months	3 to 4 Months	4 to 5 Months	5 to 6 Months	6 Months or More	No Data Available
$100,000 or Less.....	12	9	2	1			1	6
$100,001 to $300,000...	3	4	5	2	1	2		10
$300,001 or More.....	1		3	4	3		4	7

TABLE IV. Time Required in the Actual Construction of 80 School Buildings (Elementary, Junior High, and Senior High Combined) Between the Date of Award of Building Contracts and the Date of Acceptance of Building
Distributed According to the Cost of the Building

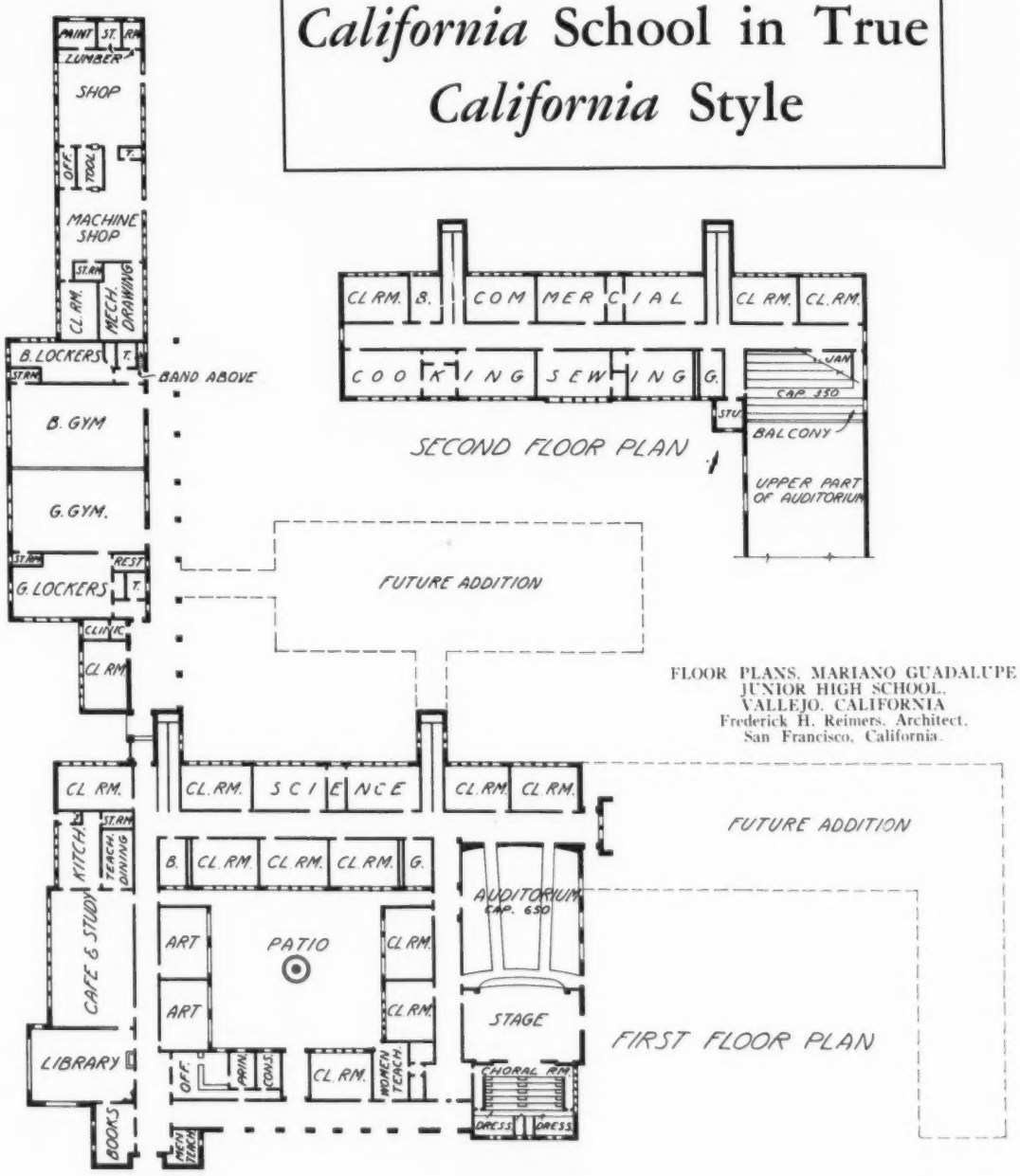
Cost of Buildings	6 Months or Less	6 to 8 Months	8 to 10 Months	10 to 12 Months	12 to 14 Months	14 to 16 Months	16 to 18 Months	18 Months or Over	No Data Available
$100,000 or Less....	12	7	6		1	2	1		2
$100,001 to $300,000	1	6	7	3	5	1	2		2
$300,001 or More...		1	1	4	8	3	3	2	

PORTFOLIO OF MODERN SCHOOL BUILDINGS



MARIANO GUADALUPE VALLEJO JUNIOR HIGH SCHOOL, VALLEJO, CALIFORNIA
Frederick H. Reimers, Architect, San Francisco, California.

California School in True *California* Style



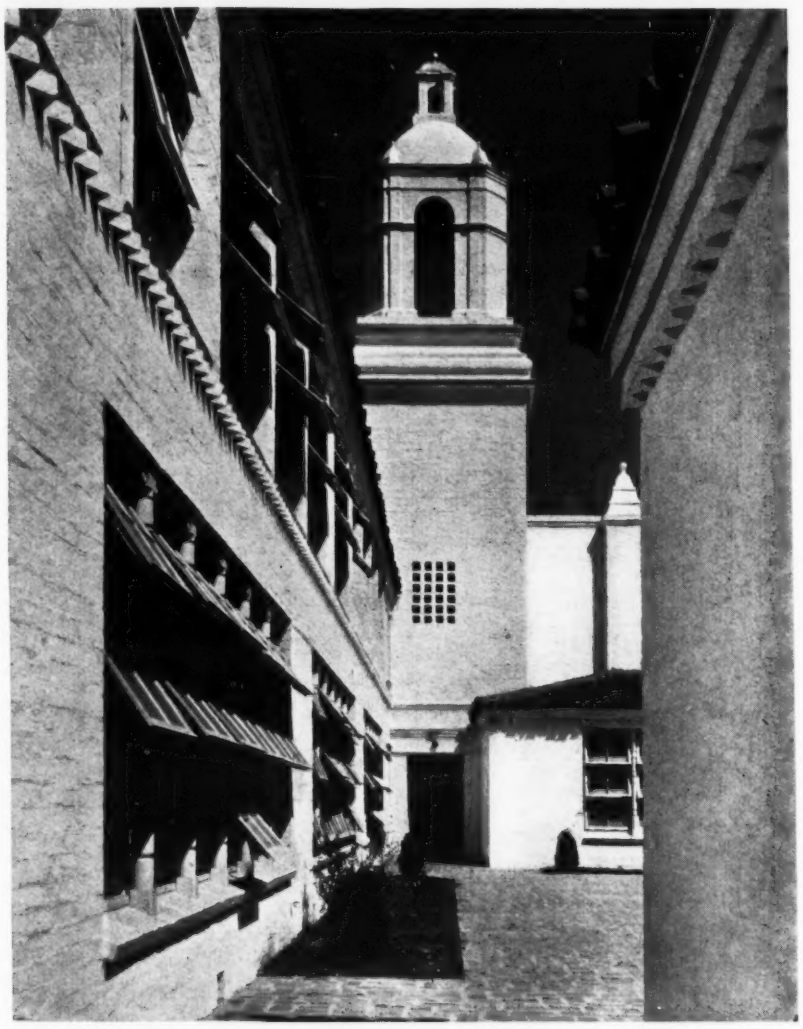
FLOOR PLANS, MARIANO GUADALUPE JUNIOR HIGH SCHOOL, VALLEJO, CALIFORNIA
Frederick H. Reimers, Architect, San Francisco, California.

The Mariano Guadalupe Vallejo Junior High School in many respects brings a new note of architectural interest into the educational system of California school buildings. Of this building it might be said that it goes to the opposite extreme in the theory of design of those who believe that our educational system is stereotyped and that as such it requires stereotyped architectural planning and designing.

The architect, the educator, the administrator each has his problems. Their problems are not opposite nor do they lack a sympathetic relation to each other. The Board of Education of the City of Vallejo, composed of Russell F. O'Hara, president; Mrs. Elon A. Mitchell, S. J. McKnight, and Dr. Elmer L. Cave, secretary, recognized that the problem of the taxpayer is primarily one of economy in its plant and operation of that plant. The board recognized that it also owed to its citizens the erection, consistent with economy, of an edifice sympathetic with the local environment and outstanding in beauty and utilitarian design.

The first problem of the Vallejo Junior High School was then its educational problem, and to this end educational experts were employed to make a survey of the past, present, and future educational problems of this district. Considering the number of pupils to be accommodated and taking into consideration the curriculum of subjects required by the State of California, a program of space requirements including the size of each and every room in the building was carefully determined. The number of pupils which should be provided for in the new building was determined by taking into consideration the present enrollment of 800 in the present junior-high-school building and the increase of 102 per cent in the junior-high-school enrollment from 1921 to 1932. This great increase in enrollment clearly indicated the necessity of erecting a building which would take care of the present enrollment, and provide for at least 200 more. Provision was therefore made to house at least 1,000 pupils in the new building.

ENTRANCE TO AUDITORIUM



VIEW OF TOWER FROM PATIO

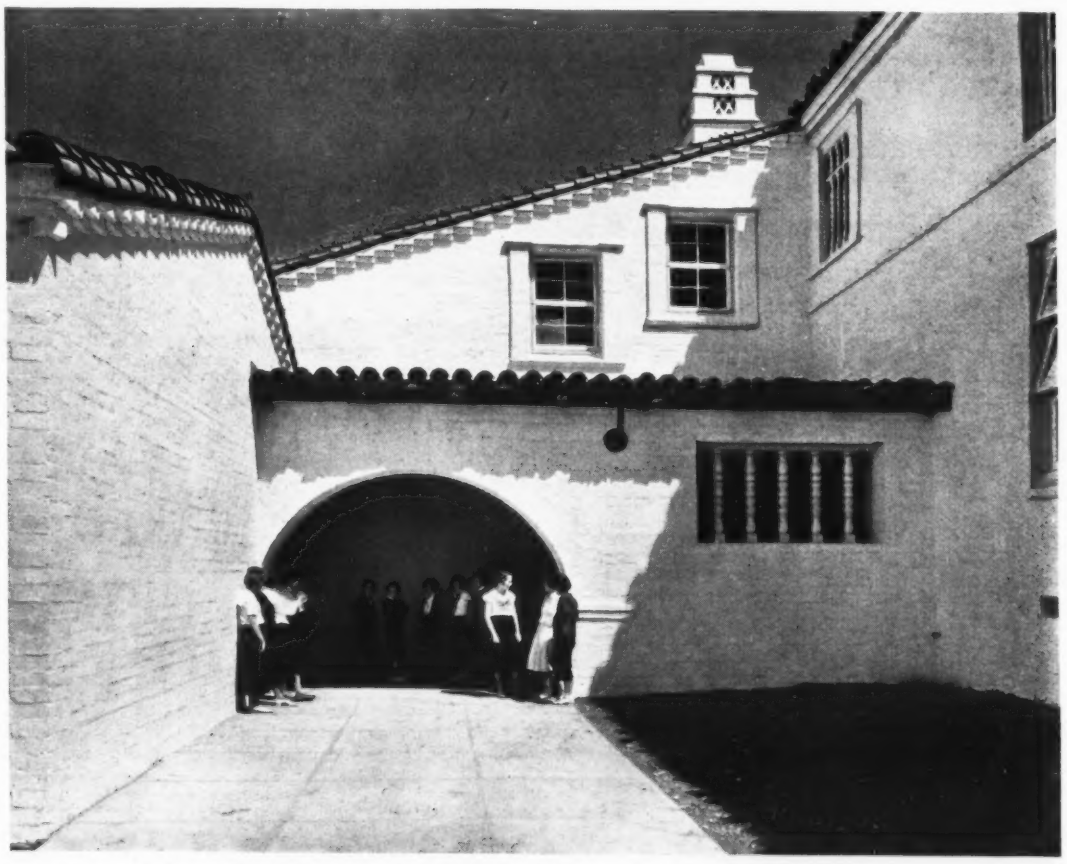
Mariano Guadalupe Vallejo *Junior High School,* Vallejo, California

Frederick H. Reimers, Architect, San Francisco, California

The new building has 30 classrooms, an auditorium which seats at least 1,200, a library room, a choral room, a study hall, a cafeteria, a gymnasium, shops, laboratories, a bookroom, and rooms for the administrative part of the school.

For administrative economy the program stipulated the relation or proximity of the various departments, and in this connection there is the question of the distance of travel, the noise factor between classes or departments, the odor traveling between departments where cooking or chemicals are used. It is obvious that the band should not practice in the room adjacent to one where mathematics is to be taught, and equally obvious that there would be little study in the English room if the pleasant odors of baking biscuits should come up from the lower floor just before twelve o'clock. The pupils training their voices must not at the same time entertain the entire school interested in other and more quiet studies. Four or five hundred pupils entering or departing from the auditorium must not disturb the entire building in their meanderings after leaving the exits. The library where quiet must prevail, the gymnasium where freedom for play must be unrestricted, the shops where noise and rough usage must prevail; all of these features were the problem of the experts, as was the central operating room from whence the entire plant is administered in control of the entire operation and isolated for privacy.

With all of these problems to satisfy, there was a desire to build into the Vallejo Junior High School a historic background that would recall the early California history of the city and its great founder, General Mariano Guadalupe Vallejo. It was decided early in the problem that the building architecturally should be definitely a California design, that it should include the motives of the Mission architecture of California, and relation to the structures of the



AN INTERESTING CORNER, MARIANO GUADALUPE VALLEJO JUNIOR HIGH SCHOOL, VALLEJO, CALIFORNIA
Frederick H. Reimers, Architect, San Francisco, California.

LIBRARY, MARIANO GUADALUPE VALLEJO JUNIOR HIGH SCHOOL, VALLEJO, CALIFORNIA
Frederick H. Reimers, Architect, San Francisco, California.

Padrés. The Vallejo Junior High School may be described as California architecture. It is low in general design. Its plan is essentially a one-story scheme tied together with corridors and patios in a form resembling somewhat the early missions of California. The architect studied carefully the proportions of the arcades of San Juan Baptista, the parapets of San Gabriel, and the towers of Santa Barbara, and the subtle inequalities and the details of their architecture have been worked into the design of this modern building. This California character is further instilled into the design by the use of a cast-stone block construction for the walls, the proportions of which resemble to a degree the proportions of the adobe bricks used in the early California buildings.

Relation of Buildings

An educational building with large window-area classrooms is difficult to handle architecturally, and such a building is usually uninteresting in spite of the skill of the architects to treat such a problem. In the Vallejo school the foreground is laid out with low one-story wings, and in this one-story portion have been placed the rooms that permitted of an architectural handling not stilted by window requirements. Behind this arcaded one-story portion is a spacious open patio where children and teachers may gather for open-air classes, outdoor play, and student-body meetings. Here we may see the children squatted on the tiled pavements listening to their teachers much as did the Indians of the Missions sit to hear the teachings of the Padrés. Behind this open patio is the main classroom wing of the building, a two-story structure which has been screened from the street by the one-story part of the building and the distance across the patio. To one side of the patio is the auditorium and choral room isolated in a semifireproof building completely inclosed in walls of masonry. To the opposite side of the patio faces the art department where the esthetically minded may look out upon the beautifully tiled patio with its fringe of shrubs. To the rear of the building and stretched out in a succession of elements are the gymnasium, the boys' and girls' locker rooms, the clinic, and fartherest removed are the shops and vocational departments.

In one corner of the patio is a graceful tower with an open belvedere at the top and surmounted by a dome of gold. Perhaps here we see the transition from the early settling of the Spaniards and Padrés to the gold discovery which marked the new California that we know today. The tower is practical and not an unnecessary expense, for it houses the giant air-condensing fan equipment that supplies the auditorium with its air changes, and at the same time adds greatly to the architectural beauty of the building.

Of the construction it could be described as a class C structure with outer walls completely inclosed in masonry. The visible parts of the roof are covered with handmade tiles similar to those used in the early Missions of California. A feature of the engineering design is the large trussless roofs of the auditorium and the gymnasium. These roofs known as Lamella construction are a system of bolted interlocking wooden ribs similar in design to the arched dome. The corridors of the two-story classroom building are of concrete for fire protection. A feature of the construction is that all partitions throughout are insulated with a fiber material over which the plastering is done, this material retarding the passage of sound between the rooms and the loss of heat from within and the entry of cold from without. The hardwood floors in the gymnasium are of maple. The classroom floors have been covered with linoleum. The finest black slate available has been used for the blackboards throughout.

The windows of all the classrooms are equipped with the latest hardware of the awning type, permitting each sash to be opened from a central control at the bottom and allowing complete light and ventilation control of the windows.

Interesting Frescoes

An interesting feature of the interior decorative treatment is the frescoing of all the plastered walls by a method similar to that used centuries ago by the great Roman architects and later used in California by the Franciscan builders. The coloring is applied to the plaster while the plaster is wet so that it becomes an integral part of the plaster. The fine millwork and woodwork of the interior have not been painted in the ordinary fashion but have been antiqued as in our early Spanish buildings.

The administrative program for the building and the program for its parts is the work of Dr. F. W. Hart and Dr. L. W. Petersen of the educational department of the University of California, and Elmer L. Cave, superintendent of Vallejo city schools. Mr. Frederick H. Reimers, architect, was associated in his work with Norman H. Green, structural engineer, and Robert L. St. John, consulting mechanical engineer. These men collaborated with the architect to produce this modern, efficient, and beautiful junior-high-school building for the City of Vallejo.

MADISON SCHOOL, WINONA, MINNESOTA. Boyum, Schubert and Sorenson, Architects, Winona, Minnesota.

The *Madison* School, Winona, Minnesota

The new Madison School Building is one of the tangible results of a school-building survey of the Winona, Minnesota, school district, undertaken by Professors M. G. Neale and S. B. Severson, of the University of Minnesota, in the year 1922. At the time, there was a distinct shortage of classroom space in the city, due to the fact that the existing grade-school buildings were not properly located and there was, consequently, overlapping of the districts. A number of the buildings had outlived their usefulness and were no longer suited to the comprehensive educational program provided for children in the grades. The outcome of the survey was a comprehensive plan for the rehabilitation of the school plant, including the erection of a central junior high school, the redistricting of the city, the construction of several new elementary buildings, and the improvement and enlargement of several existing elementary buildings. The rearrangement of the districts was especially in the direction of larger school organizations, which would afford broader educational opportunities and distinct economies in administration, teaching, and supervision.

The new Madison School Building replaces an old elementary building and an annex which occupied the same site. It occupies a city block, but has been placed close to the main street upon which it faces, leaving the large play space in a single unit at the rear and at one side of the building.

The building is planned in the shape of a huge letter H, with two corridors leading to the classrooms. The main front is to the north so that the classroom wings have the windows facing east or west, and there is direct sunlight and ample light under all weather conditions.

The building has been built without basement, except for a small portion occupied by the heating and ventilating apparatus. On the first floor in addition to eight classrooms, there are the large auditorium-gymnasium, the administrative offices, the kindergarten with a workroom adjacent, shower and locker rooms, and minor service rooms. There is no general pupils' toilet on this floor: instead the cloakroom of each classroom is fitted with a boys' and a girls' toilet. The use of the toilets in the lower grades is thus under the direct control of the teachers, and the children are encouraged to establish desirable habits and attitudes.

On the second floor there are 9 classrooms, a library, a number of storerooms, a retiring room for the teachers, and separate toilet rooms for boys and girls.

The plans have been carefully studied so that each room contributes completely to the educational program. The office is strategically placed in one corner of a front wing. Stairways are located at the ends of the corridors to make travel easy and to facilitate exit in case of danger.

TYPICAL CLASSROOM, MADISON SCHOOL, WINONA, MINNESOTA
Boyum, Schubert and Sorenson, Architects, Winona, Minnesota.

KINDERGARTEN. MADISON SCHOOL. WINONA. MINNESOTA
Boyum. Schubert and Sorenson. Architects, Winona. Minnesota.

monize with the general design and color, and the two-toned green-tile wainscoting which extends 6 feet above the floor carries decorative inserts of athletic figures.

All corridors in the building are provided with a terrazzo border and base and asphalt-tile floors. The 5-ft. wainscoting is in tones of soft tan and is decorated with tile inserts depicting animals and other objects interesting to children.

The classrooms throughout the building are plastered, have slate blackboards, cork tackboards, built-in book and material cases, and hardwood floors.

The building has been erected with permanence and reasonable first cost as the determining factors for the selection of materials. The walls are brick and tile. The exterior walls are dark variegated tapestry brick, laid in colored-cement mortar, with trim of Winona dolomite quarried in the neighborhood of the city. All the floors and roof slabs are concrete. The doors throughout are metal, as are also the casings, jambs, floor bases, and picture moldings.

The building is heated by means of vacuum steam, with direct radiation. Automatic temper-

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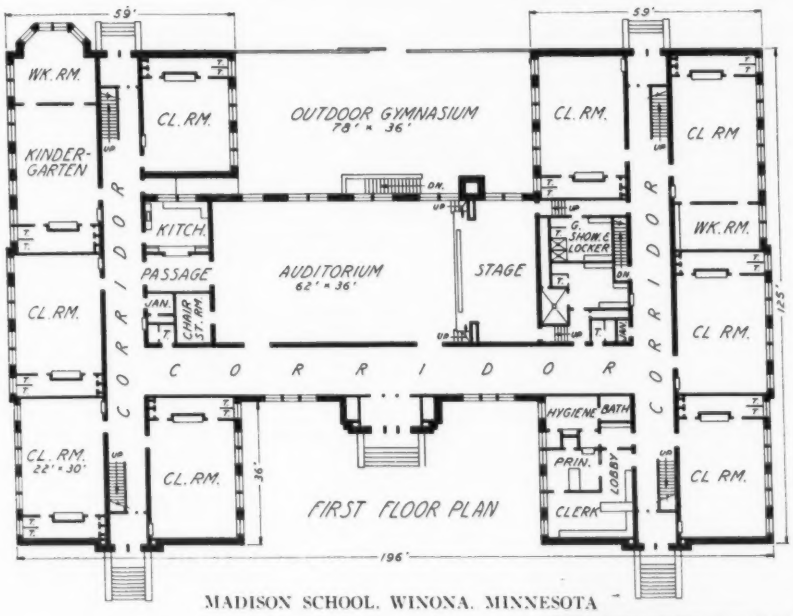
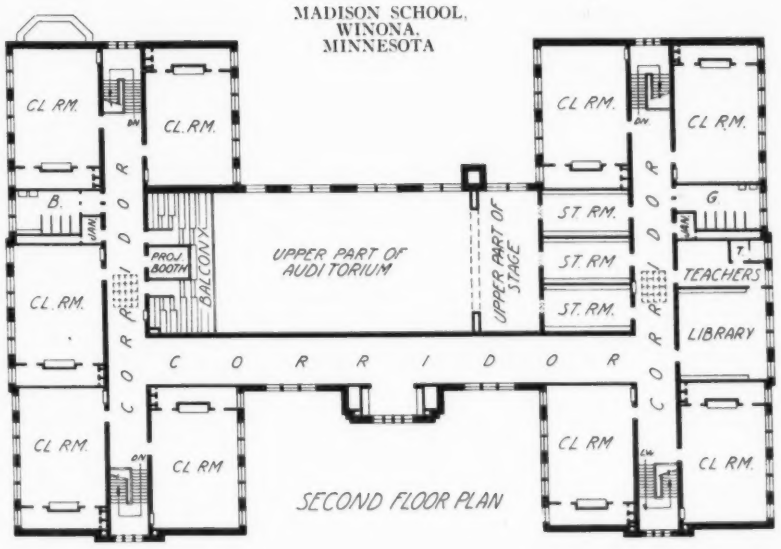
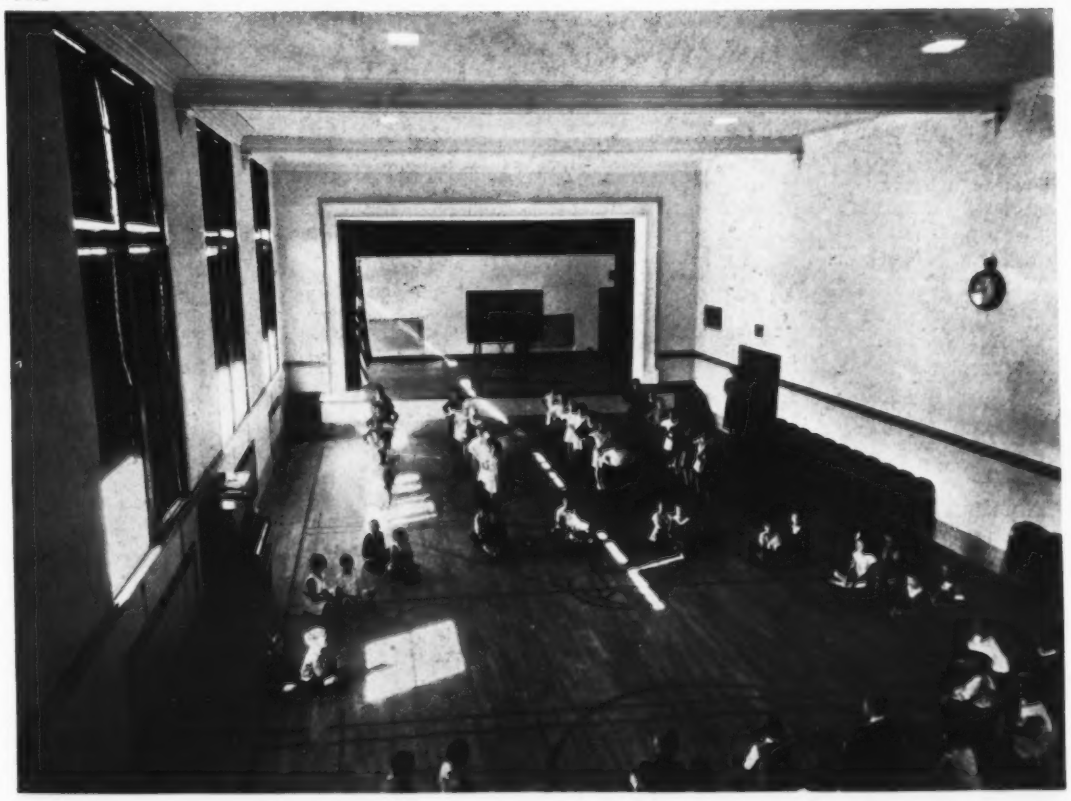


MADISON SCHOOL,
WINONA,
MINNESOTA



MADISON SCHOOL. WINONA. MINNESOTA

The auditorium, which measures 36 by 66 feet, has been placed between the wings so that it is most readily accessible from all classrooms and will also serve outside groups. It is the center for all group activities, physical-education work, music, and dramatization. It has a total seating capacity, including the balcony, of 500. The stage, measuring 36 by 21 ft., is fitted with footlights, sidelights, and curtain so that practically any type of dramatic entertainment may be undertaken. A projection booth is provided on the balcony for motion picture and stereopticon slides. The steel folding chairs are movable and are stored in a special chair storeroom when the floor must be cleared. The arrangement of the locker rooms immediately back of the stage is such that the children need not walk into the main corridor to pass from the gymnasium to the dressing rooms and showers. The entire unit has been carefully finished for rough usage in physical education, but special attention has been given to make the room attractive and dignified. The proscenium arch is carefully handled to har-



AUDITORIUM-GYMNASIUM. MADISON SCHOOL. WINONA. MINNESOTA
Boyum. Schubert and Sorenson
Architects. Winona. Minnesota.

ADMINISTRATIVE UNIT AND FLANKING WINGS, WASHINGTON JUNIOR HIGH SCHOOL, MOUNT VERNON, NEW YORK
Harold Werner and William Van Alen, Associated Architects, Mount Vernon, New York.

Washington Junior High School, *Mount Vernon,* New York

By Harold Werner

Because of its proximity to New York City the city of Mount Vernon is not only growing rapidly, but the character of its population is also constantly changing. This, in turn, reacts on the school system and its school buildings. An ultimately unified building cannot result unless the original unit was conceived for logical expansion.

The Washington Junior High School, as completed in 1933, demonstrates that the original unit as designed in 1925 was extremely flexible in plan, and constructed so as to allow internal changes without excessive costs. Its corridors on the longitudinal as well as the transverse axis, being left with open ends, allowed future additions in all directions. The three new wings inclosing the site exit on all three streets. The disposition of the east wing on a business street, one of the main arteries of the city, gives convenient access to that part of the structure devoted to community uses. Particular emphasis has been placed on the community facilities in the school development. The two gymnasiums planned in the original unit are now supplemented by a large community gymnasium with showers and locker rooms and provisions for a swimming pool of the most modern type. The large auditorium, located in the center of the city, will serve civic and community functions as well as routine affairs of the school. There is also a small auditorium and band room, each with a capacity of 250 persons.

Many difficulties had to be overcome in combining, in the plan, the required school facilities with an auditorium of 2,500 capacity. The site is very limited and there is a continual change of grade on all three streets. The auditorium had to properly serve the community and also to coördinate with the two-story circulation of the original building.

A novel and daring solution of the problem resulted in a semicircular auditorium on a diagonal axis formed by the intersection of the two business streets and on the residential street. The north and south wings are dedicated tc the routine work of the school.

A free Georgian style was employed as an expression particularly appropriate and typifying the tradition of the Colonial period in

SMALL AUDITORIUM, WASHINGTON JUNIOR HIGH SCHOOL,
MOUNT VERNON, NEW YORK
Harold Werner and William Van Alen, Associated Architects, Mount Vernon, New York.

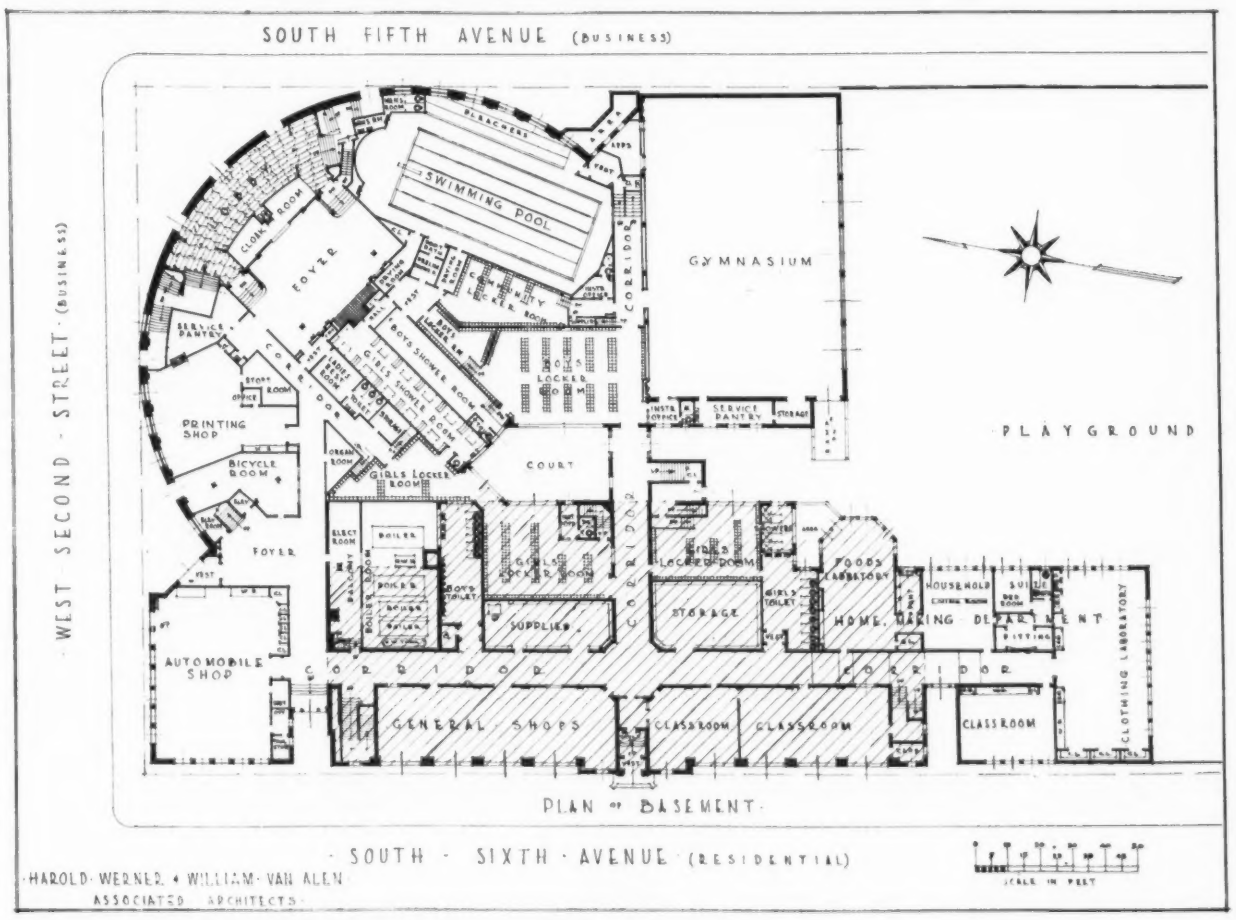
MAIN ENTRANCE TO AUDITORIUM, WASHINGTON JUNIOR HIGH SCHOOL, MOUNT VERNON, NEW YORK
Harold Werner and William Van Alen, Associated Architects, Mount Vernon, New York.

Mount Vernon. The north and south wings are subordinated in mass and are in thorough harmony with the façade of the original unit. The slender colonnette treatment of this unit is reëchoed in a somewhat heavier treatment of the piers in the auditorium wing. The rusticated basement of the auditorium is of colonial brick with a simple two-story fenestration above. Intervening are fluted piers and capitals in a modified Doric. The circular façade of the auditorium is crowned with a plain unornamented attic with flush panels incised with the words Health, Courage, Truth, Wisdom, Order, Law, Honor, and Justice, designating the educational and the cultural ideals of the school. No attempt has been made in its external expression to adhere rigidly to a period style. While in a measure it follows tradition, it attempts, primarily, to express simply the functional purposes of the school. Coherence and simplicity in plan are combined with economy in construction.

The use of a circular plan for the auditorium allows a widely distributed form of exit, as well as ample congregating space for the public in front of the building. The main lobby is on the street level and ample staircases at both ends give access to the circular cross-overs of the auditorium floor and balcony.

This semicircular balcony has a capacity of 1,000 persons and is carried by cantilever construction, connecting with the school lobbies on the second-floor level.

Maximum capacity and visibility are attained by the seating arrangement of the orchestra and balcony. It is circular and places every seat within easy hearing and sighting of the entire stage, no seat being more than 80 feet from the stage. A complete series of windows above and below the balcony give abundant and diffused light throughout the auditorium, thus effecting a considerable saving in the use of artificial light.



Washington Junior High School, Mount Vernon, New York

The amphitheater form of the auditorium gives a sense of compactness and a feeling of intimacy, unusual in an auditorium of this capacity.

In the interior design of the auditorium, simplicity is the dominating note, and ornament is sparingly used — with an insistence on careful proportioning of wall surfaces and openings. The successive wall breaks flanking the proscenium opening, allow for an organ piping installation. These breaks are increased in a constant ratio to the outer walls. The circular rear-wall treatment depends solely on exact proportioning and careful spacing of the window openings. Beautiful form and rhythm is attained by the broad and commodious sweep of the balcony with its fluted balcony front finishing in a reverse curve against the flanking proscenium piers. The circular ceiling, with a minimum use of decoration, is strikingly impressive with the use of superimposed semicircular drums. The vertical surface of each drum has a delicately ornamented frieze, each with a different motive — its relief varying according to the height and area of each drum. Although the stepped ceiling increases in height toward the rear walls, the light on the semicircular planes actually gives a decided rising and domelike effect to the ceiling over the orchestra. All of the inclosed ceiling space above is used either for vent chambers or usable areas in the superimposed rooms.

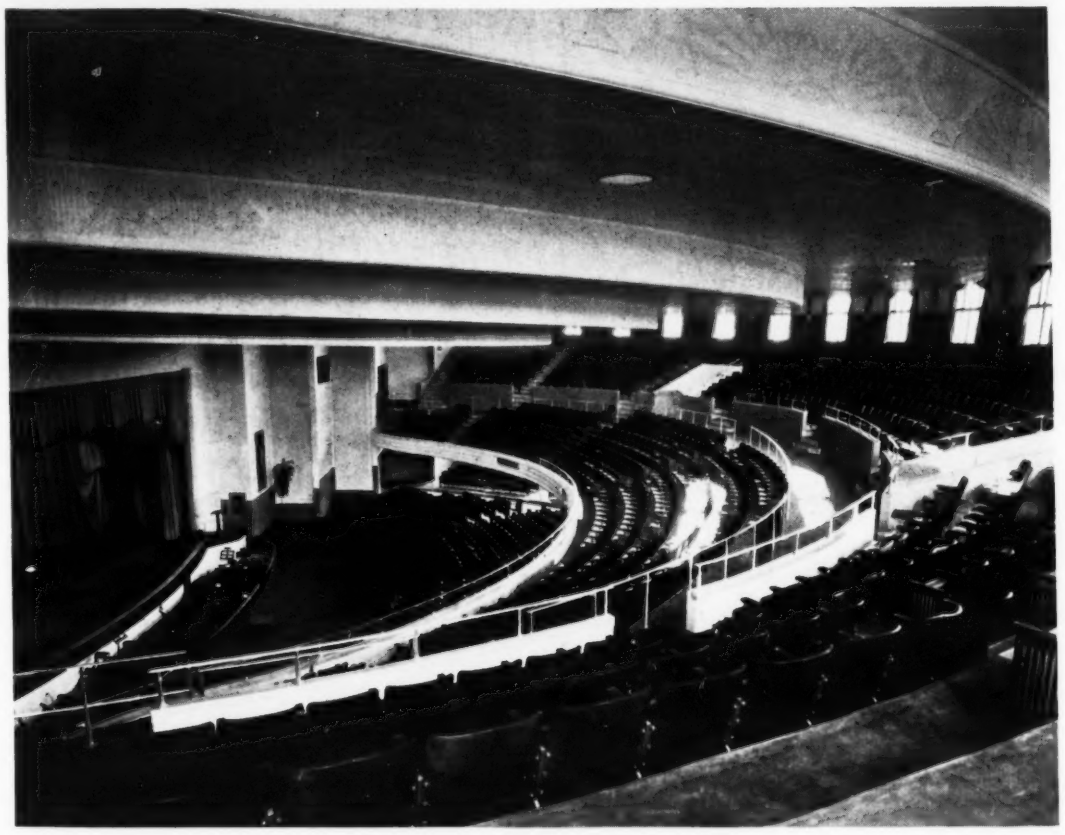
A distinctly unique and practical arrangement makes it possible to divide the large auditorium into small units for school uses. This is accomplished by tracks under the balcony ceiling in line with the circular aisles. From these tracks curtains can be suspended, dividing the rear of the orchestra into three smaller sections which can be used for lecture or study purposes, leaving the balcony and main part free for ordinary school-auditorium needs.

Artificial lighting for the auditorium is partly indirect. This is arranged by concealed lighting strips at the angles of the proscenium wall piers and also in the panels of the piers above the balcony. This indirect lighting is supplemented with flush lights on the different ceiling planes and spot lights over the proscenium as well as on the balcony front. Double border lights, stage pockets and footlights in three colors, make a complete system of stage lighting. There is a complete dimmer system for both stage and house lights. The stage switchboard is a dead-front Major type consisting of a pilot section, a remote control section, and a magazine panel for all fuses. The dimmers are arranged with a master lever for each color for the stage lights and a master lever for the house lights and a grand master operated by a slow-motion wheel so that any desired combination of dimming the lights can be obtained.

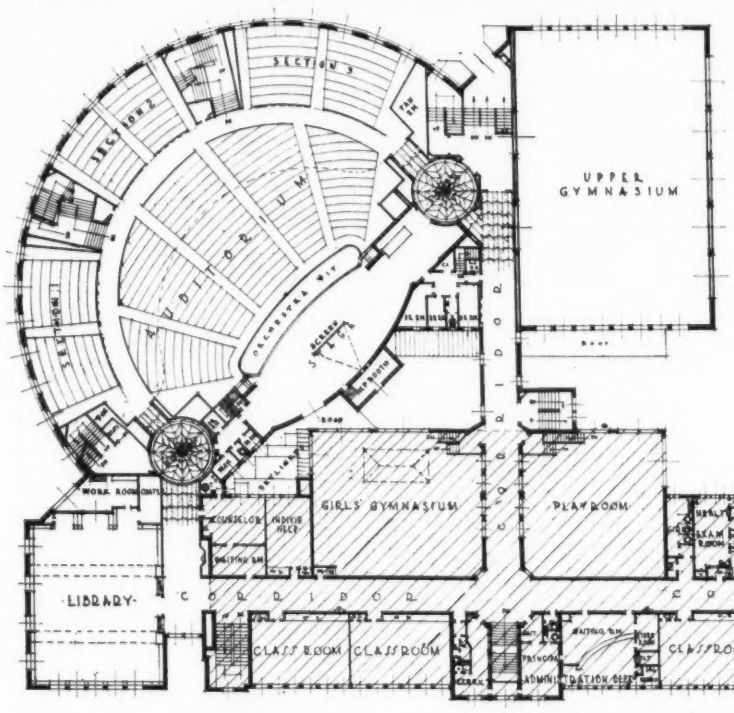
The moving-picture booth is an isolated unit to the rear of the stage. This rear projection is a modern feature in school construction. It eliminates fire hazard, panic, and disturbing beam lights in the auditorium.

The acoustical problem has been given careful consideration. The walls, ceilings, and reflecting surfaces are so arranged that they overcome any difficulties arising from the circular form of the auditorium. These various elements have been combined in a perfect molding of the esthetic and the utilitarian.

The stage and orchestra pit have direct access on both sides to the rest, service, and reception rooms and lockers in the basement. These rooms can also be used for large groups as an auxiliary to the dressing rooms off the stage. There is no waste area in the entire basement. These rooms have been disposed to take full advantage of the sloping orchestra floor and



AUDITORIUM FROM THE BALCONY


SECTION 3
SECTION 2
SECTION 1
AUDITORIUM
ORCHESTRA PIT
STAGE
UPPER GYMNASIUM
CORRIDOR
GIRLS' GYMNASIUM
PLAYROOM
LIBRARY
CLASS ROOM
CLASS ROOM
CLASS ROOM

have been excavated to their various floor levels. The gradients absorb the difference in elevations.

Adjoining the entrance lobby is the reception room and foyer which is treated in the Georgian manner, with a low segmental arched ceiling, natural-wood paneling, fluted pilasters, fireplace, and settles in a wall recess. The room has a restful, charming effect most suitable for small, intimate home and school functions. This room has adjoining service restrooms and toilets for both sexes. Adjacent to the foyer, a modern swimming pool is being constructed, with its chlorinating room connecting with a tunnel to the boiler room. The pool has auxiliary showers and locker rooms which can be used in conjunction with the work in the adjoining gymnasium.

In the gymnasium the glazed-tile walls and the sound-absorbing ceilings are finished absolutely flush with all openings. Light is provided for on three sides of this room. The entire south wall is of structural glass which eliminates screens and sash and simulates the out of doors. This glass has a great diffusing value and this effect of light is further emphasized on the inside wall with reflecting structural-glass panels. This is the first installation of its kind in this country.

The commercial department, directly above the gymnasium, consists of large rooms for stenography, typewriting, and bookkeeping. A small room adjoins this for the study of banking methods. In this division there is also a reference room and three auxiliary classrooms.

A small circular auditorium devoted to dramatics and an adjoining band room are carried over the main auditorium on heavy steel trusses and are partly within this construction with clerestory windows above. These rooms are thoroughly soundproofed which allows community or school functions to be carried on here simultaneously with the work in the main auditorium. Over the remaining section of the auditorium a tiled-roof outdoor recreation space is provided for. This adjunct to the physical-education department supplements the limited playground area.

The original building, now the central unit of the group on the residence street, required some minor modifications. An increased administration department, teachers' rooms, a clinic, a music room, an individual-help and counselor's room comprise the revisions.

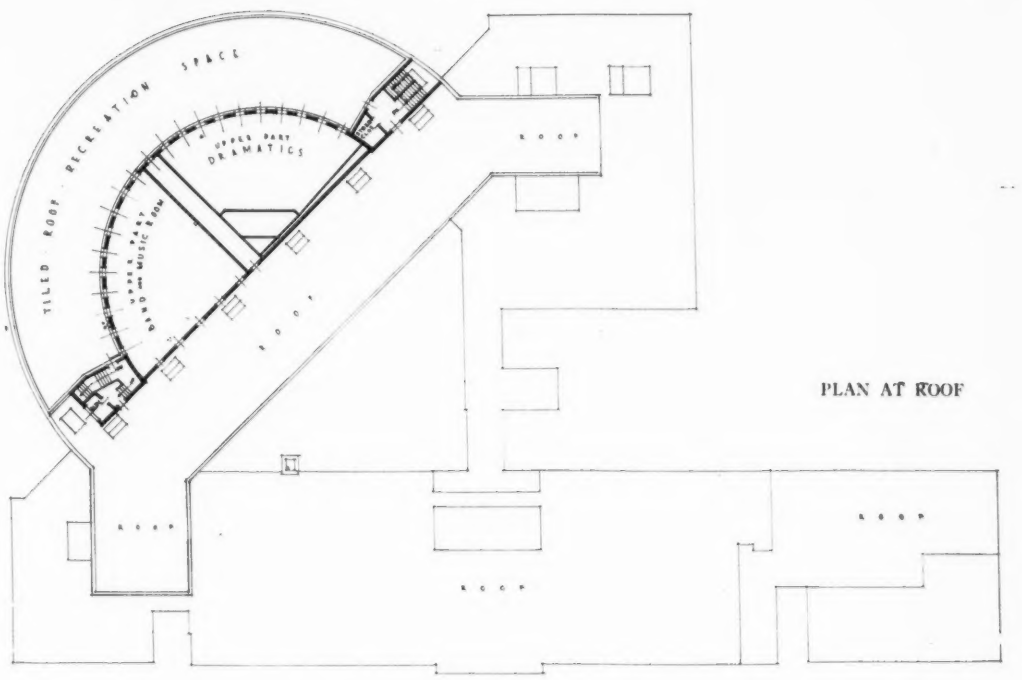
The domestic-science department in the basement has been enlarged and extended into the new south wing and includes homemaking rooms and clothing laboratories. In this wing also are included two general-science departments and seven standard classrooms. Adjoining the central unit to the north are the library and two art rooms with accessory rooms. A shop-extension room devoted to automobile work is in the basement.

Of considerable value in making the changes in the original unit, was the construction of the classrooms which had been so designed as to facilitate the decrease or enlargement of a room on a five-foot-unit basis, eliminating costly structural change. This system was originally devised by Mr. Werner, the architect, in 1923, in the William Willson Junior High School in this city and is now being followed throughout the country.

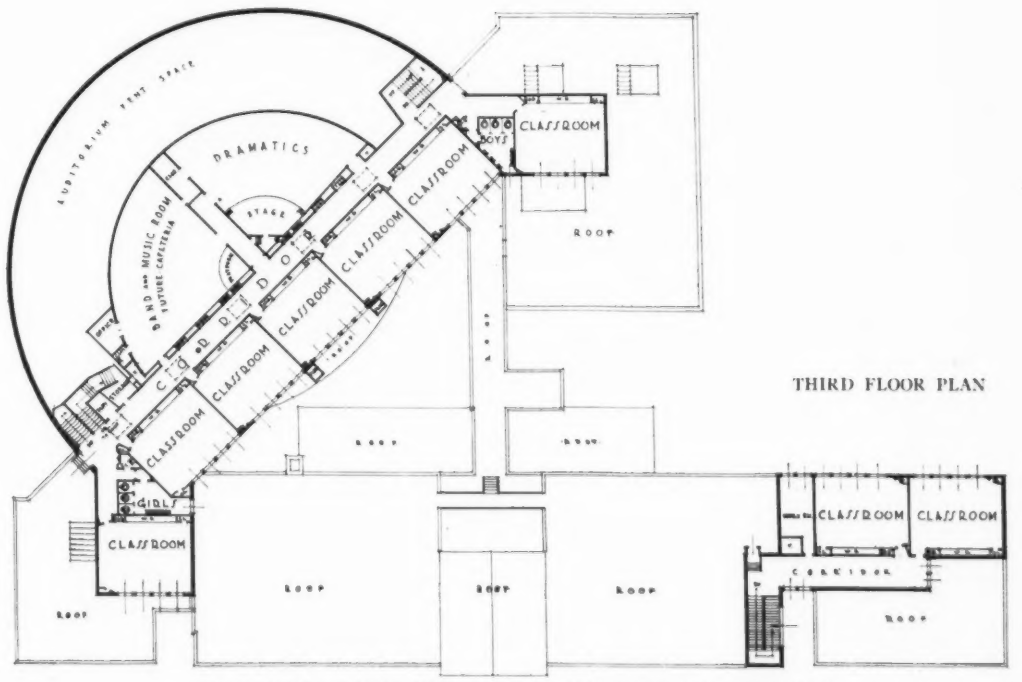
Dr. W. H. Holmes, superintendent of schools, at Mount Vernon, was also desirous at that time, of increasing the light in the standard classrooms, and this was accomplished by reducing the mullions in size, and also eliminating the customary intermediate heavy piers and substituting diffusing lens glass panels for the

(Continued on Page 56)

AUDITORIUM FROM THE STAGE



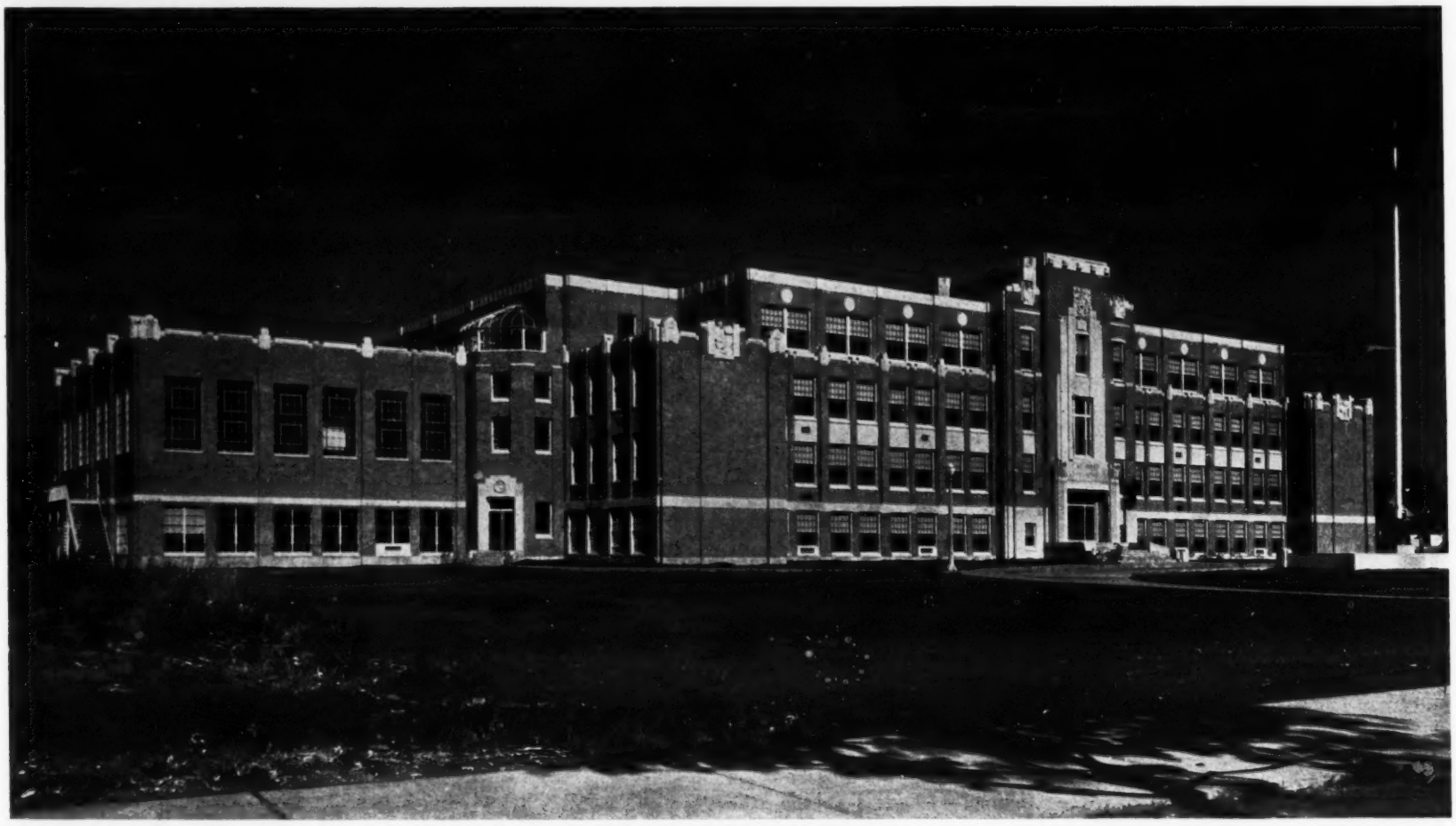
PLAN AT ROOF



THIRD FLOOR PLAN

WASHINGTON JUNIOR HIGH SCHOOL, MOUNT VERNON, NEW YORK
Harold Werner and William Van Alen, Associated Architects, Mount Vernon, New York.

Washington Junior High School, Mount Vernon, New York



MELROSE HIGH SCHOOL, MELROSE, MASSACHUSETTS
J. Williams Beal, Sons, Architects, Boston, Massachusetts.

ENTRANCE DETAILS, MELROSE HIGH SCHOOL, MELROSE, MASSACHUSETTS
J. Williams Beal, Sons, Architects, Boston, Massachusetts.

THE MELROSE High School

Practically without exception, suburban school systems are the most fortunate in the United States. They share all the advantages of metropolitan outlook and progress, and they enjoy relatively high and stable economic bases for support. At the same time, they do not suffer from the drag of huge size, politics, and municipal interference that make efficiency in the city school system so spotty, uncertain, and troublesome. Some of the most efficient instructional and administrative programs, and without question the finest school plants, are to be found in the small residential cities that have grown up during the past three or four decades in the great metropolitan areas.

Melrose, Massachusetts, is educationally such a fortunate community and its new high school is the result of a situation in which a highly competent school executive staff, an earnest school committee, and an experienced firm of school architects have coöperated. The school is the high point in the local educational program. The new building which houses the school is the fruition of ten years of educational planning and of several years of architectural planning and supervision on the part of the school authorities and the architects. The entire educational schedules for the building were prepared under the direction of Supt. H. H. Stuart, with the coöperation of Principal William B. Sprague. The building was begun in 1932 from plans prepared by Messrs. J. Williams Beal Sons Company, of Boston, Massachusetts, and was completed early in 1933. It was dedicated September 6, 1933, with impressive ceremonies in which the Melrose municipal administration, as well as the school authorities, participated.

The building is planned to provide all needed facilities for a well-rounded high-school education for 1,800 students. The school is of the four-year type and offers, in addition to the

AUDITORIUM, MELROSE HIGH SCHOOL, MELROSE, MASSACHUSETTS
J. Williams Beal, Sons, Architects, Boston, Massachusetts.

usual college-preparatory courses, a wide variety of shop courses. The building is arranged in the shape of a huge square, with classrooms and other instructional spaces facing the four adjoining streets. Corridors just inside the instructional rooms surround the inner courts and the auditorium, and lead to six stair halls located with reference to minimum travel and easy exit. The auditorium and service rooms occupy the center of the block.

The ground floor, which has full-length windows well above grade, contains six standard classrooms, a suite of four instructional rooms for home economics, two large shops, a cafeteria, locker and shower rooms for boys and girls, and space for heating and ventilating apparatus. One of the large classrooms is arranged for mechanical drawing. The main area is occupied by a cafeteria, arranged to seat 500 pupils at one time. An interesting feature is the special provision for a candy counter and the dining room for teachers.

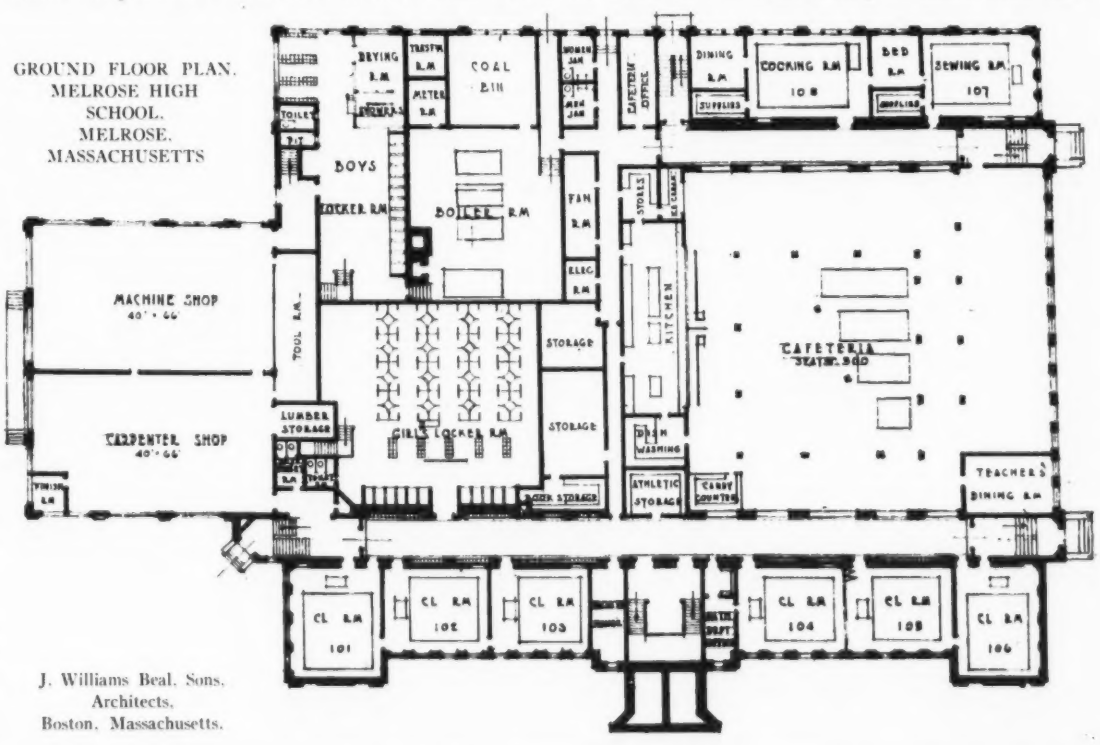
The girls' locker room on this floor is fitted with a unique arrangement of showers and dressing rooms, which reduce the number of individual showers to the minimum, which permits a practical continuous use of the same.

The shops include a metal-working shop, measuring 40 by 66 ft., and arranged for machine-shop practice and general metal work. It has a separate entrance large enough to permit automobiles to be brought in. The woodworking shop, similar in size and arrangements, adjoins the metal shop.

The first floor gives access to the auditorium, which has 1,156 seats, a stage large enough for school dramatics, as well as assemblies. At the left of the front entrance on one side, there is a complete suite of administrative offices with a private office and toilet for the principal, a waiting room, and a vault. An additional small office for the teachers is found to the right of the main entrance. On this floor there are also ten classrooms and a recitation room for commercial subjects, toilets, office and service rooms. The boys' and girls' gymnasiums are entered from this floor and occupy the space above the shops. By a clever arrangement, access may be had to these rooms from the girls' and boys' locker rooms below. A folding steel partition makes it possible to throw the two rooms into one large gymnasium, measuring 66 by 80 ft. Two corrective rooms, an office for the instructors, and ample storage space are provided.

On the second floor there are fourteen classrooms, an office for the teachers, toilets, and service rooms. Interesting features of this floor are a clinic and a special room for the school nurse, and restrooms for boys and girls, offices for the submaster and the dean of girls.

The library in the front center of the third floor is, in a real sense, the academic heart of the school. It is attractively finished with oak



GROUND FLOOR PLAN, MELROSE HIGH SCHOOL, MELROSE, MASSACHUSETTS

J. Williams Beal, Sons, Architects, Boston, Massachusetts.

Melrose High School, Melrose, Massachusetts

wainscoting, a large fireplace, and comfortable furniture. Adjoining it there are two conference rooms and an office for the librarian. Another interesting room is the dramatics and study hall which is intended to serve also for student organizations. On this floor there are six classrooms, a physics laboratory with a darkroom adjoining, two chemistry laboratories with a storage and workroom between, two general-science rooms with a supply and workroom between. Offices for the science teachers, for the English teachers, etc., are also on this floor.

The building throughout has been designed in a restrained modernistic style. The vertical note predominates on the front, inside, and in the auditorium. The exterior is constructed of sand-struck brick, with limestone trim. The floors throughout are concrete and are carried on reinforced-concrete pillars. The corridors are finished with terrazzo floors and glazed terra-cotta dado.

Acoustic plaster is used for the balance of the walls and ceilings of the corridors. The stairs are iron. The floors are mastic, except in the gymnasium, where maple floors have been laid. The toilets are finished with glazed terra-cotta tile walls and terrazzo floors.

The building is heated with low-pressure steam, supplied by steam boilers, fitted with automatic stokers. The classrooms are ventilated with Nelson univents, and the temperature is automatically controlled in all instructional areas.

The contract for the building was let in February, 1932, and the building was completed in June, 1933, and occupied for the first time in September, 1933. The total cubage is 1,980,000 cu. ft. The cost for the building only was 26 cents a cubic foot, and for the site, fees, equipment, etc., 36.1 cents a cubic foot. The general costs were as follows: General contract, $383,-609; heating, $72,846; plumbing, $22,803; electrical work, $30,813; equipment, $50,000; grading, driveway, sidewalks, and flagpole, $117,-127; architects' fees, $37,800; total cost, $715,000.

The building is planned for a minimum pupil capacity of 1,600 and a maximum capacity of 1,800 students; on this basis, the cost for the minimum number was $447, and for the maximum number, $340.

An interesting feature of the school is the probable expansion of the physical-education program which it makes possible. The site which it occupies consists of eight acres of land, and immediately adjoining it is the DeMar field, a community athletic ground.

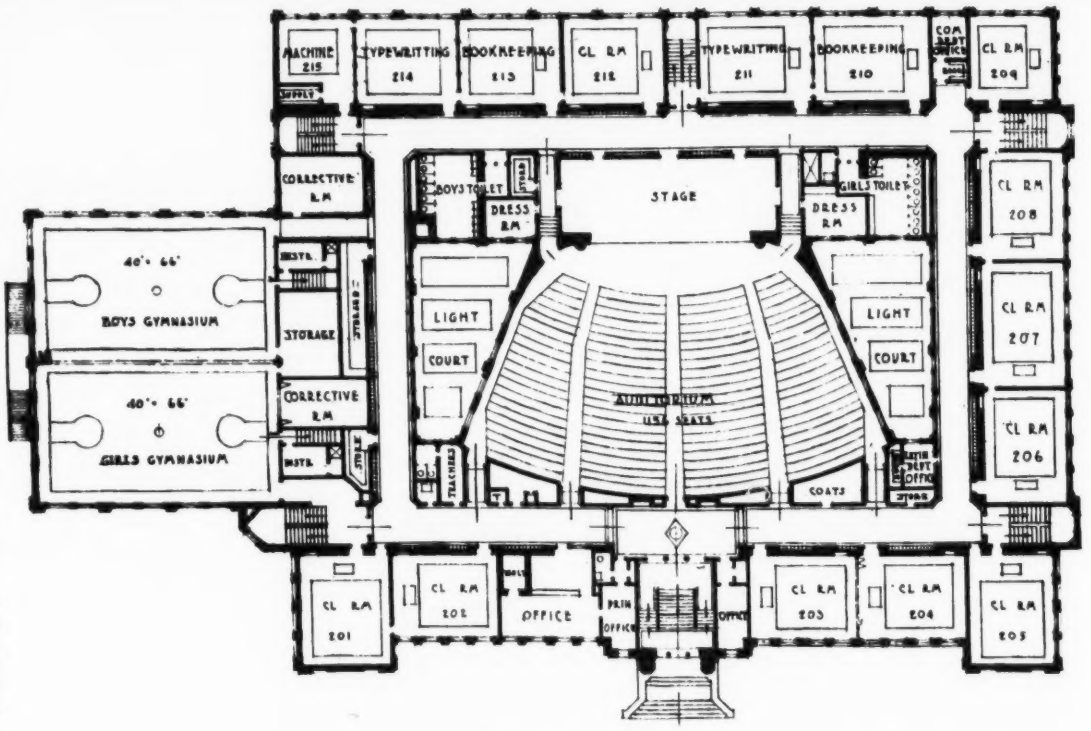
NEW YORK CITY SCHOOL TROUBLES LAID TO POOR MANAGEMENT

The State Education Department of New York, with the aid of a committee of survey experts, has recently completed a two-year study of the New York City schools. The survey experts, in their report, characterized the school system as one "offering the best in almost every phase of educational service," but which because of poor leadership and unwieldy organization, fails to utilize its advantages to the full possibilities.

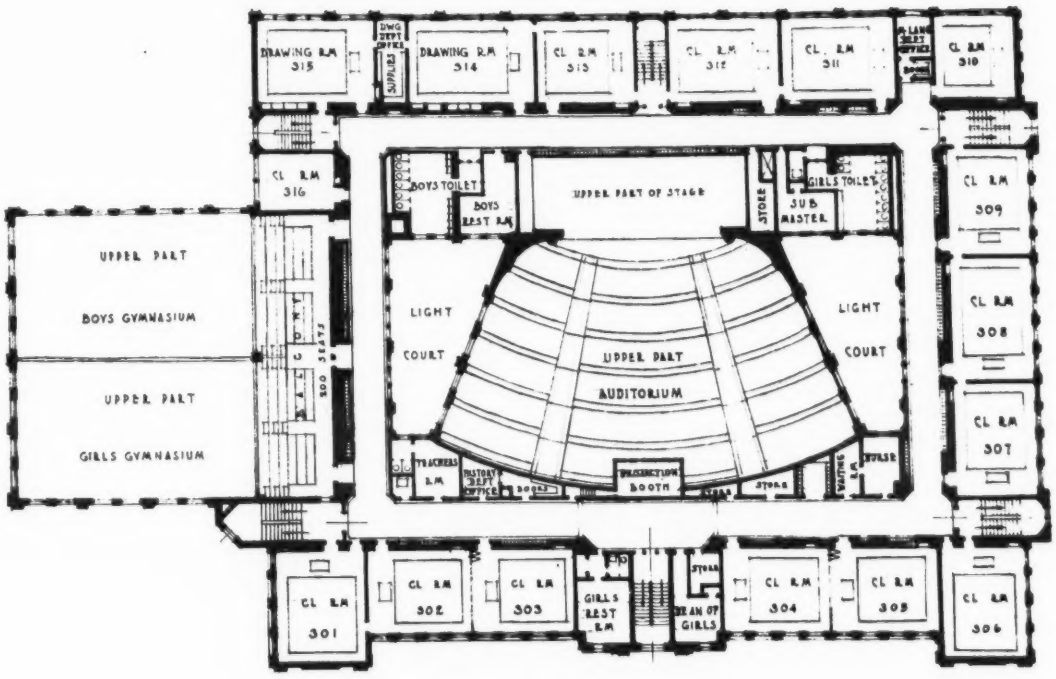
The survey experts, in their report, suggested a reorganization of the administrative and executive divisions of the education department as a remedy of the situation of the schools. Under the proposed plan, the superintendent of schools would practically become the autocrat of the school system. Two new positions, embracing an additional associate superintendent and a board counsel would be created.

Under the reorganization plan the present board of associate superintendents would be deprived of every power previously enjoyed, with the exception of that it will serve as an advisory cabinet for the superintendent of schools. At present it has some powers coördinate with those of the superintendent, and may outvote him, if it so wishes, on approval of courses of study, on adoption of textbooks, and similar matters.

In the report, the board of education itself came in for criticism from the investigators, who assert that the fifteen standing committees of the board are largely unnecessary. Three committees are all that are necessary, in the opinion of the investigators — building, finance, and law.

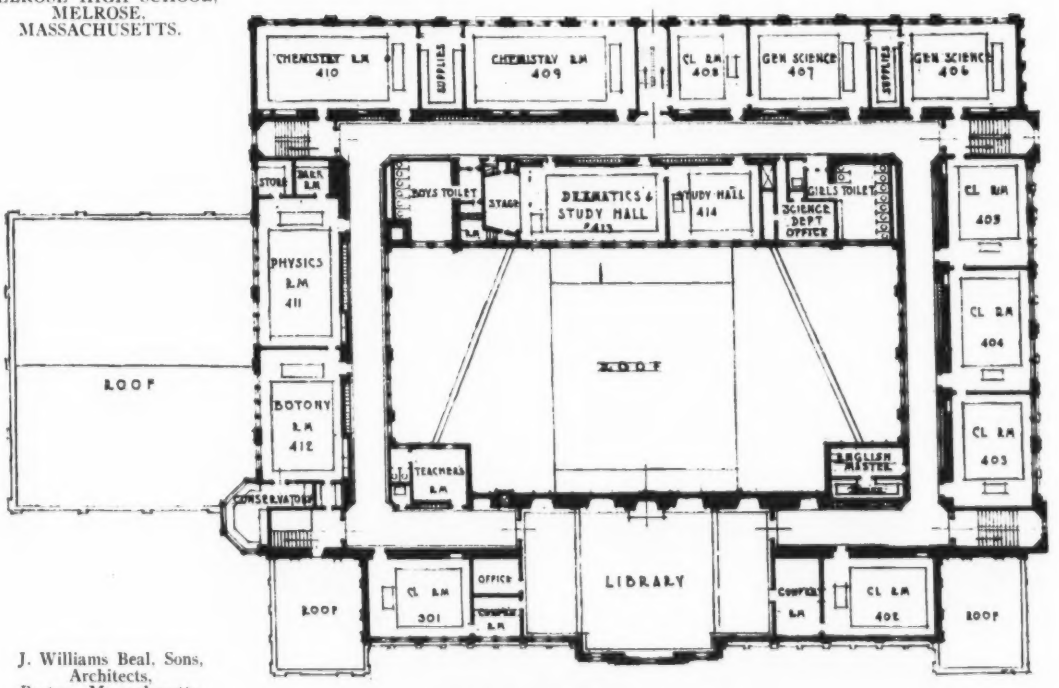


FIRST FLOOR PLAN



SECOND FLOOR PLAN

MELROSE HIGH SCHOOL,
MELROSE,
MASSACHUSETTS.



J. Williams Beal, Sons,
Architects,
Boston, Massachusetts.

THIRD FLOOR PLAN

POTTSVILLE HIGH SCHOOL, POTTSVILLE, PENNSYLVANIA

Wm. B. Ittner, Architect, St. Louis, Missouri;
D. H. Grootenboer and P. G. Knobloch, Associate Architects, Pottsville, Pennsylvania.

Partial view of the front elevation from an upper level. There is still about 100 feet of the front not appearing in the illustration. The entire length of the building across the front is 401 feet. The slope from the upper gymnasium level to the lower auditorium level is 60 feet.

An Early RECOVERY PROJECT, Pottsville's NEW High School

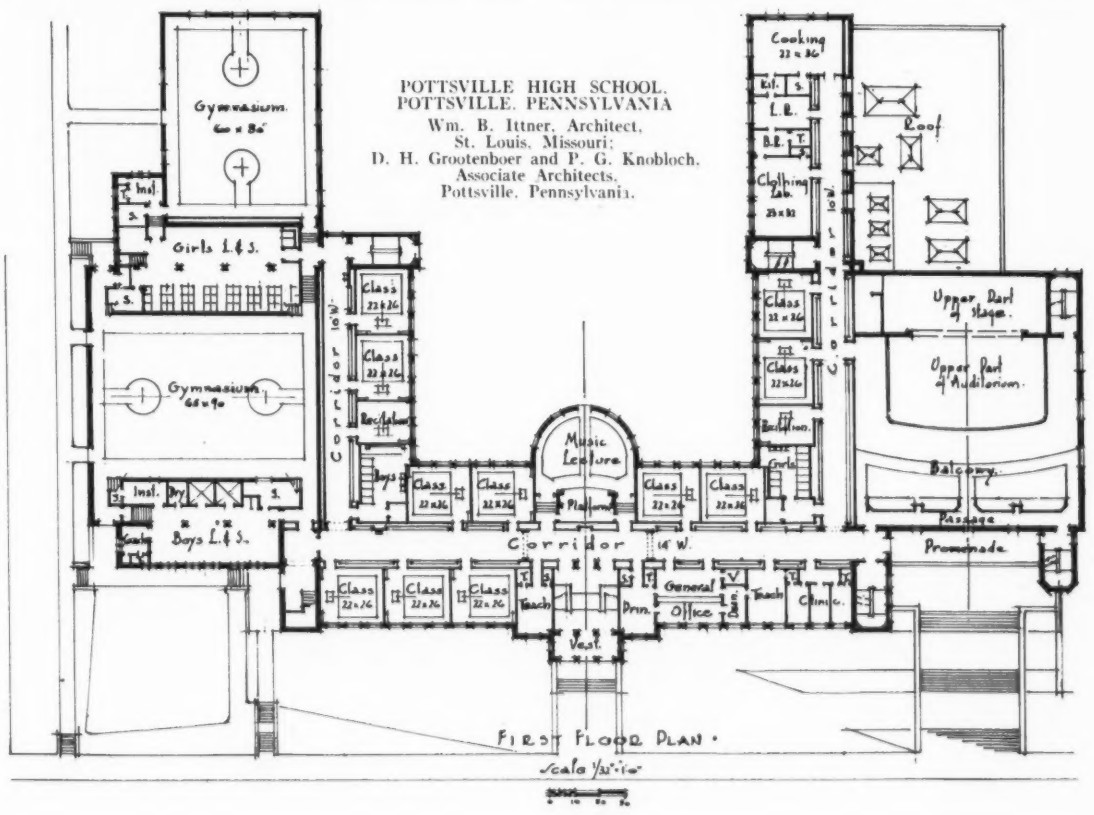
By William B. Ittner, St. Louis, Missouri

Pottsville's new high school, completed and occupied in January, 1933, represents the crowning achievement of Supt. L. A. BuDahn and his board of education. It stands as a direct result of earnest efforts to secure for their city, well-planned, efficient, and beautiful school centers, to replace worn-out and obsolete buildings. The initial result of their long-range planning is this new high school, an educational, cultural, civic, and architectural asset, capable of a many-sided educational service to youth and adults.

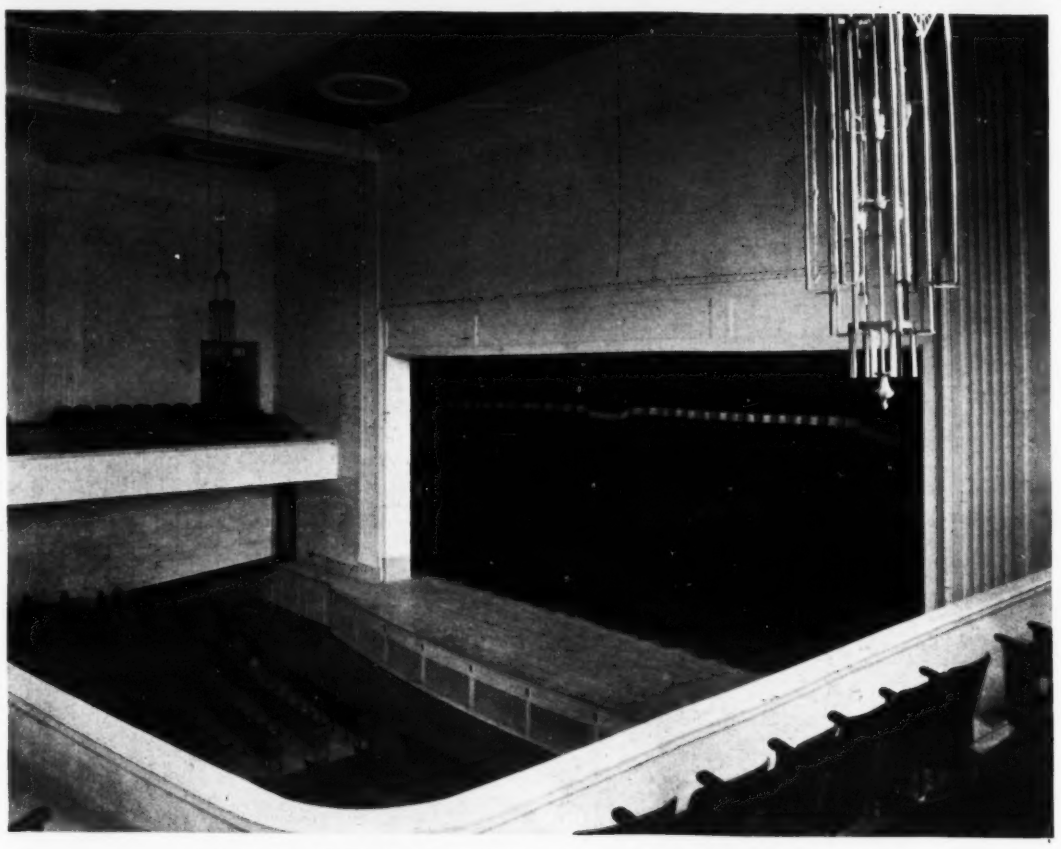
A Practical Recovery Project

Right during the depression years, when altogether too many communities were either compelled to abandon building operations altogether, or to "get by" with makeshifts of all sorts, and with shoddy planning and construction, Pottsville's superintendent and board of education, with vision and courage to back them up, developed a sentiment for, and later carried into execution, this "school of today and tomorrow," an example of "efficient economy" and beauty. The monetary value of this foresight may be appreciated when recent calculations reveal that labor and material costs have risen from 25 to 30 per cent since this school was completed. During its construction, employment was made available to approximately 250 men in and around Pottsville, and so far as it was consistent with quality of product, local materials were used. The school represents, therefore, an early recovery project, although it antedated the NRA and accompanying codes by a year or more.

After a brief history of planning and construction as already mentioned, Pottsville's new high school was completed and occupied in January, 1933. In the selection of the site, the board of education had the able assistance of Dr. N. L. Engelhardt of Columbia University. A commanding 17-acre site was purchased at a cost of $26,815. On December 16, 1930, a bond issue

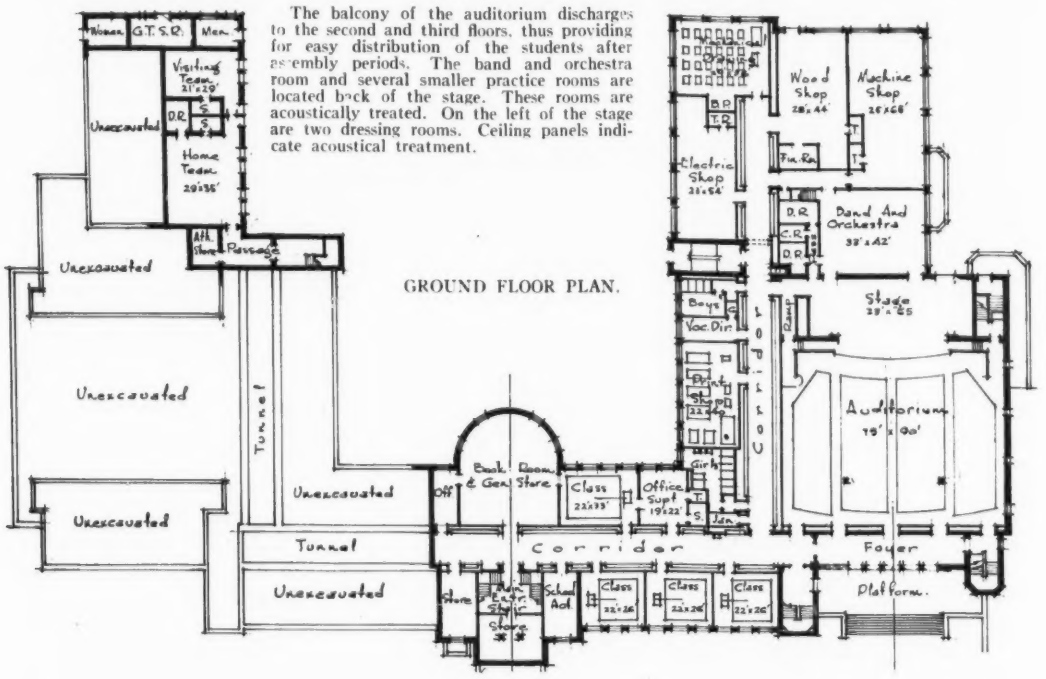


Pottsville High School, Pottsville, Pennsylvania



AUDITORIUM SHOWING PROSCENIUM AND TYPE OF LIGHTING FIXTURE.
POTTSVILLE HIGH SCHOOL, POTTSVILLE, PENNSYLVANIA
Wm. B. Ittner, Architect, St. Louis, Missouri; D. H. Grootenboer and P. G. Knobloch, Associate Architects, Pottsville, Pennsylvania.

The balcony of the auditorium discharges to the second and third floors, thus providing for easy distribution of the students after assembly periods. The band and orchestra room and several smaller practice rooms are located back of the stage. These rooms are acoustically treated. On the left of the stage are two dressing rooms. Ceiling panels indicate acoustical treatment.



GROUND FLOOR PLAN.

POTTSVILLE HIGH SCHOOL, POTTSVILLE, PENNSYLVANIA
Wm. B. Ittner, Architect, St. Louis, Missouri; D. H. Grootenboer and P. G. Knobloch, Associate Architects, Pottsville, Pennsylvania.

A partial view of the Pottsville High School from the lower or auditorium level. The auditorium is planned for 1,500 students and entered from the lower level through a commodious lobby. Owing to its location, it may give community service with little or no interference with school routine.

of $900,000 was carried, and contracts for the construction were awarded in September, 1931.

Costs Below the Average

The complete cost of the school, exclusive of grounds and equipment, totaled $788,312. Equipment costs totaled $61,865. Owing to the size of the project and the completeness and clarity of plans and specifications, bids were secured from an unusually large list of reliable contractors, with the result that cubic-foot costs dropped to 27 cents, although cubic costs in Pennsylvania ordinarily ranged from 32 to 45 cents, for fire-resistive construction. As the building can readily accommodate 2,000 students without crowding, the per-pupil cost is likewise low, being approximately $394, while the average per pupil cost for buildings of this character and educational content usually ranges from $500 to $800.

Planned for Youth and Adults

The educational plan is flexible. Although essentially a high school, it may be used at any time as a junior-senior school and, with slight alterations, for almost any other combination of groups. Nor are the educational opportunities limited to youth. Throughout the planning, anticipated community, part-time, and night-school uses have been a dominant thought. Chiefly for this reason, special attention was given to the location and character of the 1,500-capacity auditorium, the two full-sized gymnasiums with their accessory quarters, to the 500-capacity cafeteria, the library with its adjoining study rooms, and the workshops. With these enlarged educational uses in mind, entrances and exits were planned for convenience and economy, and the heating apparatus was designed by units so that various sections of the building could be heated without operating the entire plant.

Setting and Design

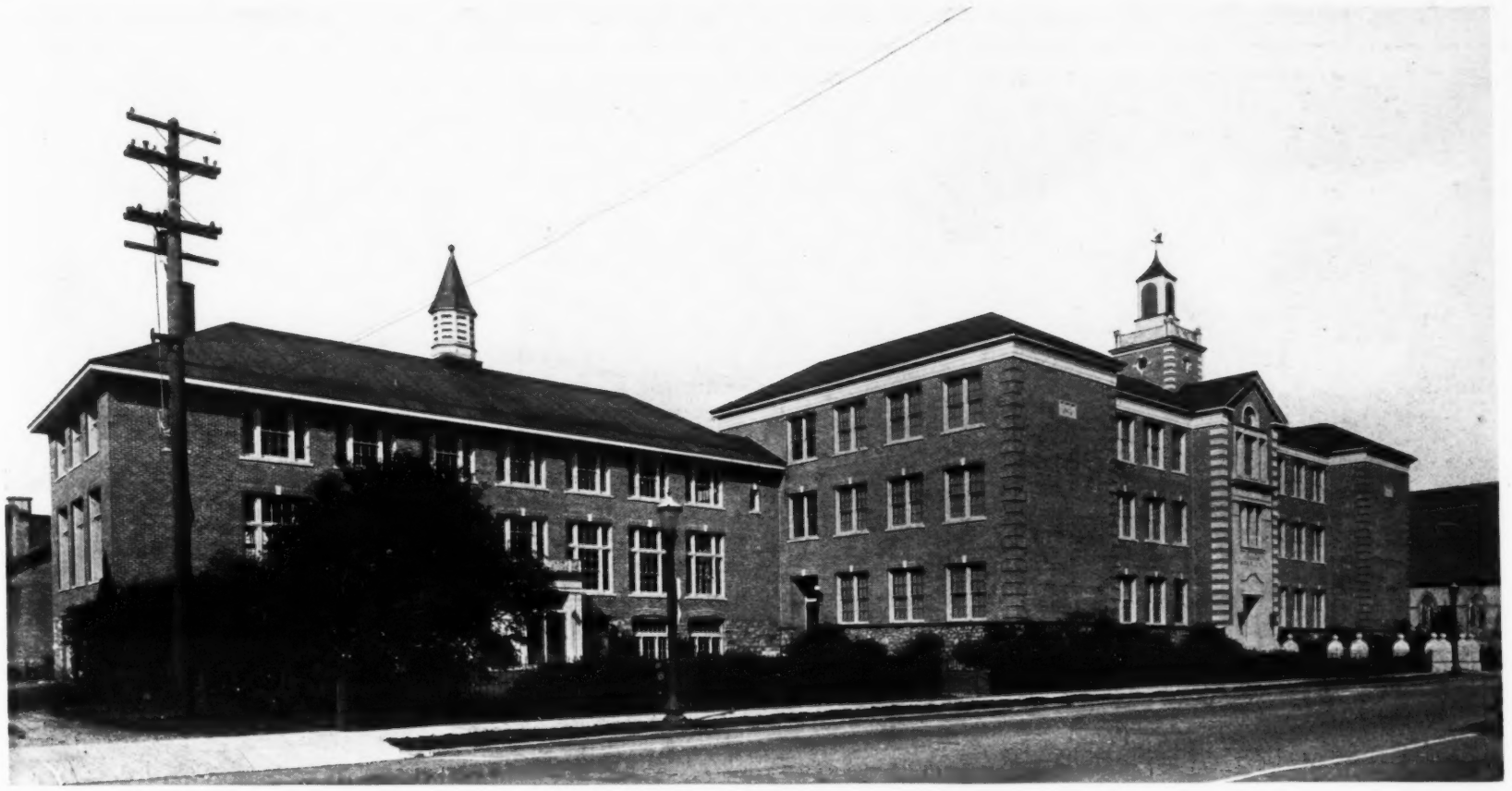
The interesting and unusual design of the Pottsville school is due in large measure to the irregular and commanding site conditions. Owing to differences in grade, the building rises gradually to five different levels, with the auditorium on the lower level and the gymnasiums on the higher. Its architectural distinction is due also to the natural evolution of a varied and well-ordered educational plan. Subordination of masses, broken outline, and an adaptation of Gothic brickwork indicate a reconciliation of the past with the present and give to the design individuality, variation, and richness of color. Briefly then in its educational content, its plan, construction, and architecture, the ensemble represents a skillful combination of the utilitarian and the beautiful.

A SCHOOL VISITATION PLAN AT FRESNO

A new plan of inter-visitation was placed in operation during the second semester of the school year 1932–33 at Fresno, Calif. Under the plan, each principal exchanged places for one day with some other principal, according to a schedule previously prepared by the superintendent of schools, Mr. O. S. Hubbard. Definite plans were made outlining the purposes to be gained by the exchange, and the procedure to be used to assure the maximum of benefit. The elementary exchange was carried out in March and April; the secondary exchange was accomplished in May.

Following the visit, the principals concerned got together for a discussion of what was seen. A written report was made to the superintendent by each principal in which the experiment was evaluated. In every case it was reported that the plan was productive of good results in suggestion and stimulation for better work. Some principals felt that better results would be secured by visits when the principals were at home to interpret their plans and to point out the high spots in their schools. Others suggested that visits between the various divisions of the school system would be of value.

Visits were also made during the year by junior-high-school counselors to elementary and senior high schools and by the teachers of sixth grade to junior high school. Reports indicate that these visits were very valuable.



ISHPEMING HIGH SCHOOL, ISHPEMING, MICHIGAN
The Warren S. Holmes Company, Architects, Lansing, Michigan.

The *Environmental Influence* of GOOD School Architecture

C. L. Phelps, Superintendent of Schools, Ishpeming, Mich., and Warren S. Holmes, Architect, Lansing, Mich.

Increased Demands for Schools

A citizen in New Britain, Connecticut, recently sought opportunity to say to his superintendent of schools that "he did not see the schools of today doing as good work in the fundamental subjects as was done in the schools of his day when facilities were meager by comparison." This statement was the outcome of a double concern. First, the welfare of his own children in school, and second, some doubt as to the policy of spending so much of the taxpayers' money for new buildings and equipment.

The answer from Dr. Stanley Holmes was immediately forthcoming:

"That may be true. Your school assumed no responsibility for you beyond seeing that you passed your grades — but I am primarily interested in your boy as a good citizen. I want him to be strong and healthy, courageous, interested, courteous, cultured, skilled, and dependable. I value his character above his scholarship, likewise his ambitions, and friendships.

"He is living in a different home and in a different age and our schools must endow him with a wealth of intellectual and emotional resources, from which he can constantly draw to counteract the grind and adversities of life, now speeded up to the automobile pace. For this we must have buildings that offer opportunity, not only for study, but for participation as well, that arouse his curiosities and excite his interests, that lead him on to do for himself, for the best education is self-education, experience, desire in learning. I suppose that you will admit that you have gotten most of yours since leaving school.

"Indeed, I must have buildings that emanate education, classrooms that suggest and facilitate the desired procedure, that characterize the subject matter to be taught. I must accomplish much by indirection, by suggestion, by example."

The Architecture of Education

Thus, a new phase of education, the need for studied environment, has rapidly developed. It may be called the architecture of education. It endows buildings with new meanings, new purposes, a new philosophy for the school building. Educational environments are a quality of the school building, above and apart from the construction, much as music is above and apart from the instrument from which it comes.

No specialty is newer than the designing of environments that educate. It is the distinguishing mark of the school-building specialist today. In no other phase of his work is the school superintendent so dependent on a specialist as in the designing of a new school building.

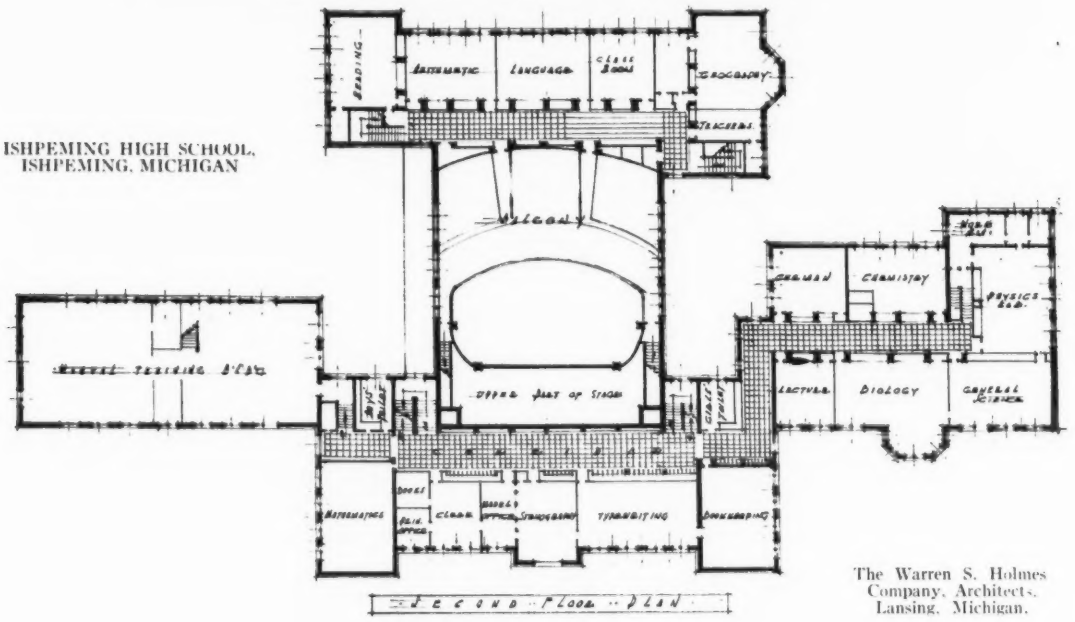
The influence of environment is well established. All are familiar with the contentions of the two factions; those who believe that man is influenced most by environment, and those who believe the stronger influence to be heredity. It is only with the former that the schools can make their contribution.

Certain well-known environments bring to

ENGLISH ROOM, ISHPEMING HIGH SCHOOL, ISHPEMING, MICHIGAN
The Warren S. Holmes Company, Architects, Lansing, Michigan.

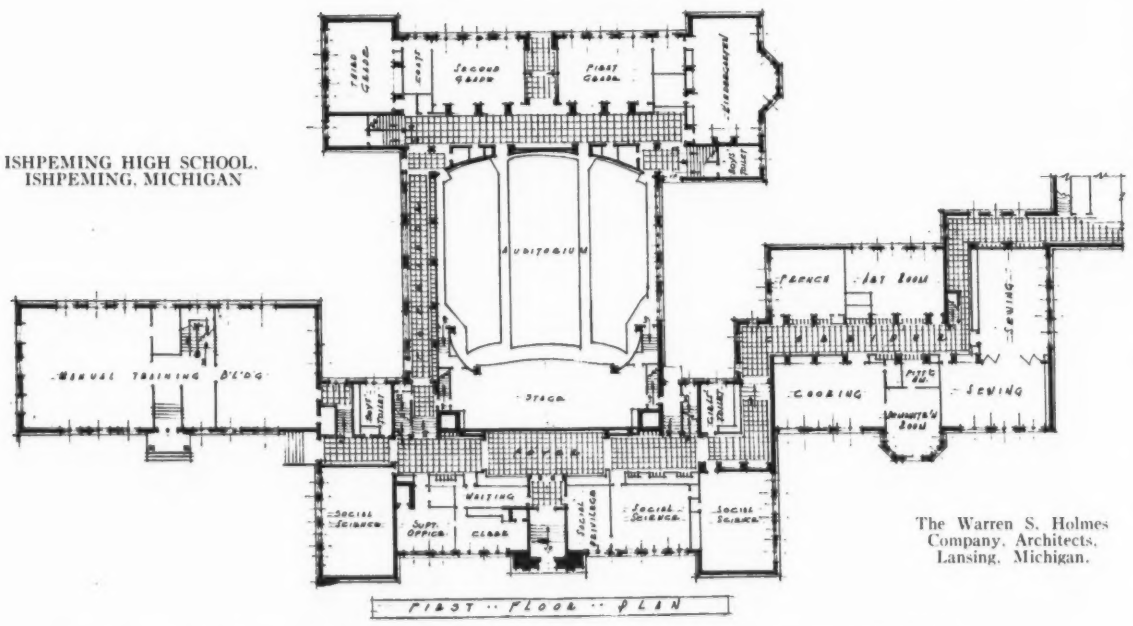
KINDERGARTEN, ISHPEMING HIGH SCHOOL, ISHPEMING, MICHIGAN
The Warren S. Holmes Company, Architects, Lansing, Michigan.

ISHPEMING HIGH SCHOOL,
ISHPEMING, MICHIGAN



The Warren S. Holmes
Company, Architects,
Lansing, Michigan.

ISHPEMING HIGH SCHOOL,
ISHPEMING, MICHIGAN



The Warren S. Holmes
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Lansing, Michigan.

mind characteristic procedures, as, for example:

The church suggests reverence and the sublime
The theater, amusement and entertainment
The park, freedom and nature
The countryside, rest and quietness
The mountains, grandeur and inspiration
The library, books and reading
The shop, construction
The laboratory, experimentation
The gymnasium, games and athletics.

While these terms characterize certain distinctive environments, they likewise suggest participation. It is just as possible to design environments that invite participation and characterize such schoolwork as study, English, languages, social science, etc.

Examples — The Study Room

The architect must obviously possess a detailed appreciation of the objectives and procedures sought, as well as a knowledge of the teaching requirements. Participation in study, for example, must obviously be psychological; attitude is a contributing factor.

The study room that pleases, interests, and offers opportunity to the student generates purposeful attitudes; while a study room that limits the pupil's freedom and displeases, creates attitudes most unfavorable for study. Herein lies the criterion for a successful study room, for improper attitudes spell failure for the study room, regardless of its other qualifications.

Proper attitudes in the study room may be likened to "good will" in business. Good will is built up by rendering a personal service that fills a need and is appreciated. One would not succeed to any marked degree in building good will no matter how valuable the service dispensed, if it failed to fill some personal need, or to create a favorable impression.

To fill personal needs in study, materials that pupils like to study must be provided, as well as that prescribed for study. From subject matter he likes to study a need may be created for that which he should study, and the latter thereby becomes endowed with values that make it seem worth while.

This policy suggests a departmentalized library on open bookshelves, readily accessible from the study room, where pupils have an opportunity to browse from one branch of human knowledge to another, pausing where interests attract.

It suggests a variety of magazines and newspapers where events of the present, as well as the past, are available in attractive form for reading and contemplation.

It suggests comfort, freedom, interest, and variety. When these are disposed of in an orderly procedure by the hand of the artist in a suitable room, the result is *environment*. When the room is further dressed up for the occasion of its use by color schemes, pictures, plant life, etc., the so-called artistic touch, the room takes on atmosphere — the human attraction.

It is just this element of "the human attractions," that is needed to be injected into the academic schoolwork of today to provide for participation. It represents very nearly the difference between abstract study and experience.

Embellishments do not constitute school environments as some have thought. The fundamentals are found rather in the proximate and intermediate objectives of education, the outstanding functions of each schoolroom.

The Kindergarten

To determine what shall properly characterize the kindergarten, such questions as the following must be answered:

What will attract the child of this age?
What will interest the child of this age?
What will encourage the child of this age to participate?
What will develop the child of this age?
What surroundings will create the desired school attitudes in the child of this age?
What type of procedures are to be encouraged?
What will best tend to the growth of the child, naturally, mentally, emotionally, and physically?

The architect answers these questions in terms of building materials, color schemes, decorative motives, built-in facilities — the elements that go to make up a building and its furnishings. In attacking his problem thus, the architect seeks to educate by carefully studied environments. He sees his school building as an investment in opportunities, not limited opportunity, but opportunities that compound with

the years. Each year his building is to become better equipped to educate boys and girls, as its environments become more complete, more perfect, and better adapted by the hands of teachers and pupils.

To succeed in this direction, it is essential that the architect be far more than a visionary. He must see into the future from the pedestal of experience and of interest in education. He must know school children and school procedures like he knows bricks and stone. His art represents an entire new encyclopedia of education. It adds cost to the school building and appears to be expensive. But is it expensive? It is the essence of efficiency in modern education. It is the marginal profit realized directly in terms of education on an investment in concrete, steel, brick, and stone. It adds permanency and long, useful life to a school building — a luxury under the old theories of education; a prime necessity under the new.

A School Building That Helps to Educate

The problem at Ishpeming had many complications. A fire had burned off the roof and partly gutted the central building of a group of four buildings built adjacent and contiguous but not connected.

The central building was a poorly constructed shell, three stories with deep basement. To one end was built a two-story-and-basement building, and to the other end a similar building used for grade purposes; to this grade building was added the gymnasium building. All four buildings were constructed at different periods and without any attempt to connect them or line up their floor levels. All had common-brick exteriors and flimsy interiors of ordinary construction, except the gymnasium, which was a fireproof building of expensive construction, with face brick inside and out. The auditorium, located on the third floor, was used for a study room. Church buildings of wood construction occupy the corner in front of the gymnasium. While Ishpeming is rich in mining ore with rock cropping out of the ground on all sides, the site of these buildings is filled with 20 ft. of mucky soil.

The iron-mining companies, which pay 95 per cent of the taxes, proposed that these buildings be remodeled into a modern school plant by utilizing and salvaging the existing buildings.

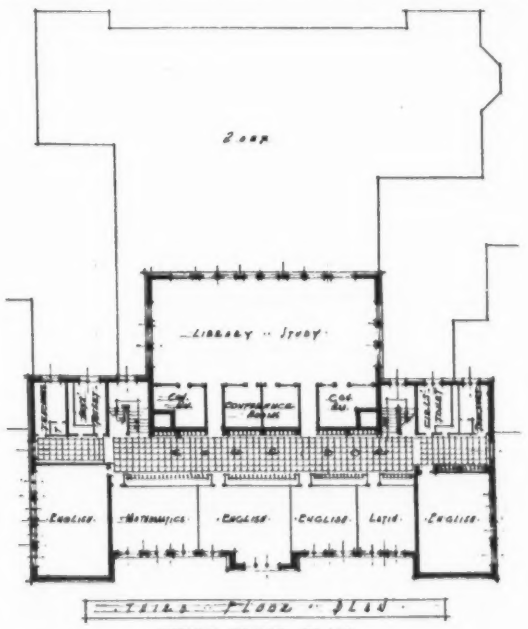
Two features of these buildings lent themselves admirably to this accomplishment. First, the exterior window spacing proved to be on approximately 10-ft. centers, making it readily adaptable to a unit system of building, providing the flexibility necessary to guarantee long, useful life to the buildings and thereby safeguard an investment in good construction. The second consideration was an offset of approximately 5 in. at the top of the stone foundation walls, which provided a suitable ledge on which to start the face-brick veneer to match the gymnasium.

The Initial Step in Rebuilding Process

The first move in the direction of rebuilding was to make a rather careful, thoughtful, unpretentious survey of the entire school system and to allocate to the central group of buildings that part of the school system that would best serve the city from this location, having in mind probable future developments. The next step was to set up a comprehensive outline of school procedure for the central group of buildings with the thought that it would be desirable to accomplish at once and make ample provision for development and growth through consistent progress in the coming years. This opportunity was seized upon to push the city school system ahead many years in its advancements, and to bring about in the short space of one year the dreams of a great many years. To take it from the plane where the standard was the best that could be done under the serious handicaps of an antiquated and inadequate school plant, and to place it on a plane where the only handicaps are the physical limitations of teachers and their students.

ENGLISH ROOM, ISHPEMING HIGH SCHOOL, ISHPEMING, MICHIGAN
The Warren S. Holmes Company, Architects, Lansing, Michigan.

FRENCH ROOM.
ISHPEMING HIGH SCHOOL, ISHPEMING, MICHIGAN



THIRD FLOOR PLAN

A New Plant for a New Program

The result has been a complete redesigning and rearrangement of both the school program and the school plant.

The grade school, which was organized on a platoon or departmental plan, was placed in a new wing by itself off the rear of the central building. A modern auditorium to seat 1,200 was placed on the ground floor, between this grade wing and the central building, readily accessible to both grade and high school and the public as well. This location obviated the lost motion of classes passing around this large room in going to and from classes.

A homeroom library study plan was adopted for the high school, with the academic classrooms grouped around the library study. Likewise the science and vocational work was departmentalized and grouped in plan. The buildings were connected with convenient corridors and stairways, the interior construction made modern and fireproof, and every square foot of wall space in corridors and classrooms alike was developed to perform efficiently an educational task.

To transform such a conglomeration into a modern, convenient school plant is in itself a notable achievement, reflecting great credit on the board of education and those who served them in the task. The outstanding achievement is the appeal and impetus given to study, to school attitude, and to education on a higher plane, by the arrangement of the interior which has been carefully studied to accomplish this purpose.

Interests Created by Environments

A new theory of education is in evidence the moment one comes within sight of the main entrances. There are two entrances, one for the high school, and another for the grade school and auditorium.

The glass doors of the entrances contain interesting leaded-glass designs that draw one on for closer inspection. The beauty of the vestibules and foyers as seen through these doors make an irresistible appeal to enter, to satisfy curiosity, and to learn what manner of school this new building is.

Upon entering, it is clearly evident this rare beauty is not simply to attract but rather a friendly welcome. Conveniently located seats bid one stay awhile and be comfortable. Exhibit cases and bulletin boards quickly direct the attention to the school's activities, and the attractive figured tile in the corridors encourages the desire to wander and explore. The little trick played at the entrance doors is repeated at the classroom doors off the corridors. A glimpse of one of the classrooms makes inspection equally irresistible; each is a study in itself. There is revealed, work leading to

(Continued on Page 54)

SPECIAL ROOMS for NEW Chicago Elementary School Buildings

Don C. Rogers, Director of Research and Building Survey, Chicago Public Schools

A contribution of the Chicago public schools to the Century of Progress Exposition was to have been a model elementary-school building, designed to show one hundred years of school-building progress. The site, near the south entrance to the Fair grounds, is owned by the board of education; the pupils are there; temporarily housed in portables; the building plans are completed. One of the disappointments due to the depression is the postponement of the construction of this building; funds have not yet been found for letting the contracts.

Certain features in the plans of this school building may be of general interest. The floor plans were laid out by Thos. J. Higgins, assistant director of the Bureau of Research and Building Survey. They were reviewed by 29 leading American school architects and educators, expert in school-building planning. Following is a description of three special rooms:

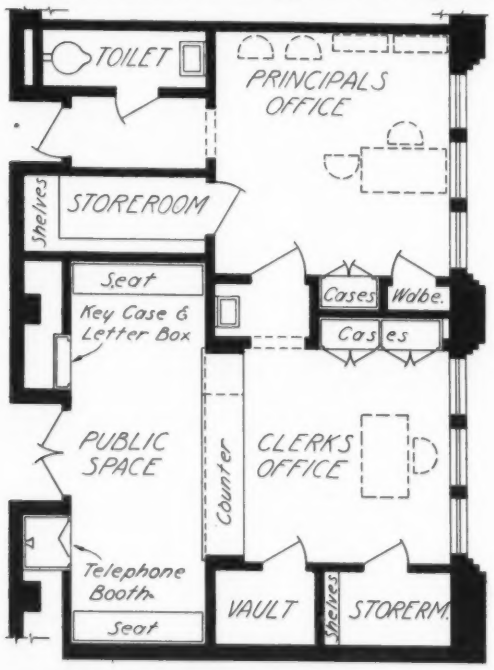
Kindergarten

The kindergarten is located on the first floor, opposite the main-entrance foyer. A visitor should gain a favorable first impression of the school, for he sees, through double French doors, a large, well-equipped, colorful room and the interesting activities of the youngest children.

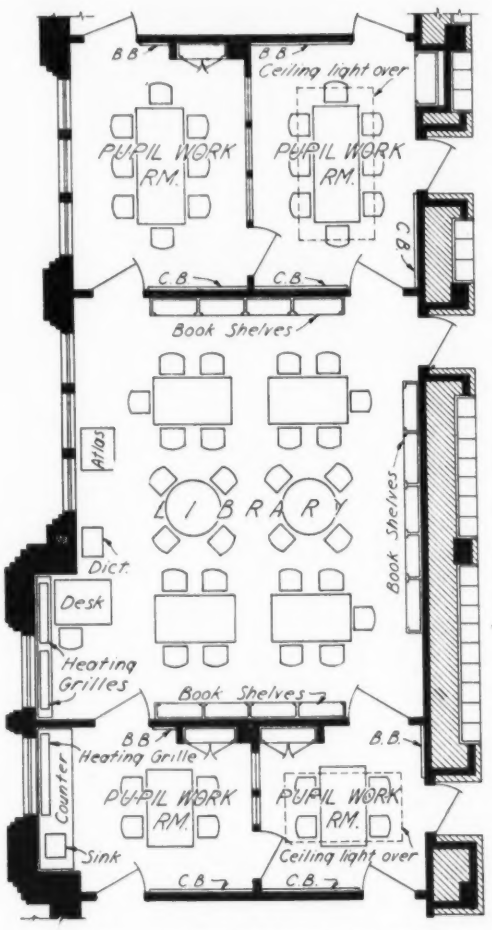
The kindergarten room conforms rather closely to a type-plan used in all recently constructed Chicago school buildings. It occupies space equivalent to two academic classrooms. Permanent partitions separate the storeroom, toilets, and lavatory from the kindergarten room proper. There are separate toilet stalls for boys and girls, equipped with juvenile fixtures. There is a wardrobe for pupils' and teachers' cloaks, a drinking fountain, and a sand box.

The room combines attractiveness with utility. There is a decorative fireplace in the center of one end wall, flanked on each side by open bookshelves, above which are corkboard panels. The doors of the wardrobe are covered with blackboard. The floor is laid with rubber tile in variegated shades of green, blue, and yellow. The furniture and wood trim are enameled.

The room deviates from type in two respects:



PRINCIPAL'S OFFICE UNIT FOR NEW CHICAGO ELEMENTARY-SCHOOL BUILDING



LIBRARY UNIT FOR NEW CHICAGO SCHOOLS

the sun bay and the folding partition. A circular seat forms a radiator inclosure within the sun bay, and in the middle of this seat there is a flower box at window-sill height. A terrazzo pool for fish is placed in the center of the bay. The kindergarten may be divided into a playroom and a project room by a folding partition which, when closed, is recessed in a niche in the corridor wall. The partition contains a small communicating door permitting access to each room.

Office Suite

The principal's office is located on the first floor, at the right of the main entrance. It overlooks the front campus. This suite occupies space equivalent to one academic classroom unit but it is partitioned for efficient administration. The waiting-room space for the public is provided with seats at each end, over which bulletin boards are hung. A telephone booth and a combined key case and letter box are recessed in the walls. A symmetrically placed counter separates the public from the clerk's space. Above the counter is a decorative plaster arch. Admission inside is provided by a drop leaf and counter gate.

The clerk's space is supplied with the necessary furniture, supplemented by cases, a storeroom, and a steel vault for the protection of valuable records and equipment. There is a lavatory for use by the clerk.

The principal's private office is a room of pleasing proportions and efficient layout. The light is ample. There is a case and wardrobe of generous proportions in one wall. A storeroom and a private toilet room adjoin. A feature of special interest to administrators is the inner office, which may be entered or left through a private entrance.

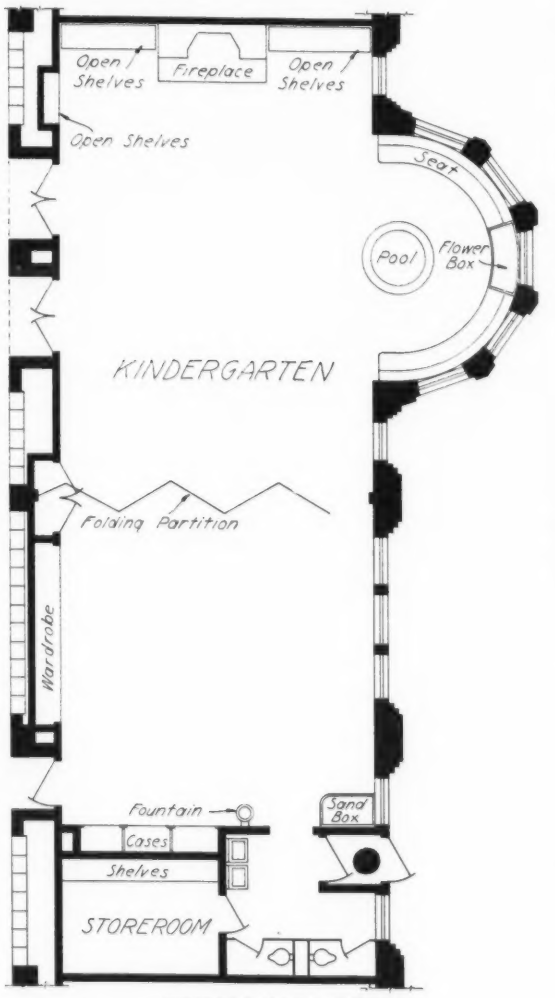
Library

The library is located near the center of the top floor of the building in order to be accessible to upper-grade pupils with a minimum of corridor travel. It is about one and one-half times as large as an academic classroom. The space is laid out to provide a central reference and reading room surrounded by four small pupil workrooms. The central reference and reading room and two of the workrooms have outside light from a tier of windows on one side. Two of the workrooms have ceiling daylight. All are provided with adequate artificial-lighting fixtures.

Each pupil workroom is equipped with a round table, chairs, a blackboard, and shelves for reference and work material. One workroom has a sink for hand washing and for use in pasting and repairwork.

Not only does this suite provide good facilities for library work, but it also provides a good atmosphere; for example, a harmony in color, finish, trim, furniture, flooring, and a sound-deadening effect by the use of rubber tile on the floor and acoustical material on the walls and ceiling.

In this case the library layout deviates from the type plan in use in other Chicago elementary-school buildings; it has been planned to satisfy the exact needs of a particular school. The Century-of-Progress school is intended to be an experimental and progressive school. The classrooms are of varying size. It will be possible to enroll large groups for audience types of instruction, medium-sized groups for individual learning, and small groups for committee work. The large average enrollment per teacher and the proposed plan of departmentalized organization provide such a flexibility of program that one teacher may be released from the responsibility for a homeroom. She will not only be in charge of the central reference and reading room but will also supervise simultaneous activities in the four small workrooms. The pupil activities in the workrooms are to be



KINDERGARTEN UNIT

(Concluded on Page 56)

Trends in School-Building *Construction*

Elwyn E. Seelye, Consulting Engineer, New York, N. Y.

It has been the common practice in the past to build schools with flat-plastered classroom ceilings, fireproof floors, and brick-masonry exterior walls, brick or tile corridor bearing walls, and tile or gypsum classroom partitions.

On account of the searchlight which is being turned on costs of school construction these days, a short review of current practice would seem timely. This subject has been much confused by commercial propaganda.

What does it cost to build a school fireproof as compared with nonburning, nonfireproof, or frame? What does it cost to secure flat-plastered ceilings, as against rubbed concrete, or plaster with beams showing? What are the advantages and disadvantages of each?

Classification of Buildings

To define the above terms in the sense they are used here, a fireproof building is one in which all walls are masonry and all metal supports are protected by an adequate thickness of concrete or other masonry so that a hot fire such as might be caused by burning stored chairs will not materially damage the structure except by smoke.

A nonburning building is one in which no wooden walls, partitions, beams, or floor slabs are used but in which the steel is not adequately protected with fireproofing material. In such a building burning chairs may well bring down, or seriously impair, the floor above and perhaps some walls or trusses in the vicinity, but the remainder of the structure will not be damaged except by smoke.

The nonfireproof structure is one with masonry exterior walls, and possibly interior bearing partitions, but with wood floors and beams, and stud partitions. Any small fire in this type of building is likely to spread through the entire structure and destroy it.

The frame building is wood throughout, including the exterior walls and is, of course, the most hazardous of all, being subject to fire from outside sources, such as other burning buildings, in spite of all internal care and precautions.

Comparative Costs of Various Types of Buildings

The proportional cost of foundations, walls, floors, framing, and plaster in a school building is much smaller than is generally realized, and that of heating, ventilation, electrical work, finish, decoration, special building equipment, and grounds considerably larger.

Take, for example, a fully fireproof school having brick walls with face brick, with finish and equipment to match, which can be built today for $200,000.

The use of wood-joist floors and stud classroom partitions would save about $13,000, and by substituting stud corridor bearing partitions for tile another $6,000 might be gained.

By giving up the brick exterior walls for wood a further reduction of $18,000 is possible, but these apparent savings are by no means real as becomes immediately obvious.

In sacrificing the safety and permanence of the $200,000 first-class, fireproof building for the extremely hazardous frame construction, a reduction in first cost of $37,000 has been attained, but only at a considerable increase in maintenance and insurance costs which, of course, extends to the contents. Insurance rates vary widely in different localities, under varying degrees of fire protection, and with other features of the building, than those we are discussing, but assuming differences which are believed to be essentially representative and a value for the contents of the building of $50,000, the annual insurance cost on building and contents may well be over $670 higher on the frame building than on the fireproof school. With interest on school bonds at 5½ per cent, this increased annual cost of insurance would justify an additional initial cost of $12,200, and a further item of maintenance is outside paint which, if capitalized at the same rate, would increase the allowable first cost by at least $8,000.

In other words, the real saving to the taxpayers by foregoing permanence, appearance, and fire safety is only about $17,000 or 8.5 per cent.

By taking the $13,000 saving due to the use of wood floors and framing, and retaining the masonry bearing walls, the capitalized insurance penalty is reduced to $6,700, leaving a net saving of $6,300 or 3.15 per cent.

The foregoing figures show clearly that the difference between the best and the worst in school buildings is not 25 or 30 per cent, as many seem to visualize it, but a maximum of 8.5 per cent, and when the most elementary concessions are made to appearance and safety by using masonry walls less than 4 per cent.

To effect substantial additional savings, it will be necessary to go further than the structure itself and look elsewhere in the educational and mechanical equipment, finish, and other items.

However, the economical building is the result of many small savings and they should be wise ones. Therefore, while it certainly seems inadvisable to take the whole 8.5 per cent and house our children in a dangerous firetrap, it may be interesting to see what can be done in the way of cutting cost, without jeopardizing their lives or incurring severe maintenance or insurance penalties.

To consider a nonburning floor system instead of full fireproof construction, immediately suggests the steel joist which is the best known and most commonly used system at the present time.

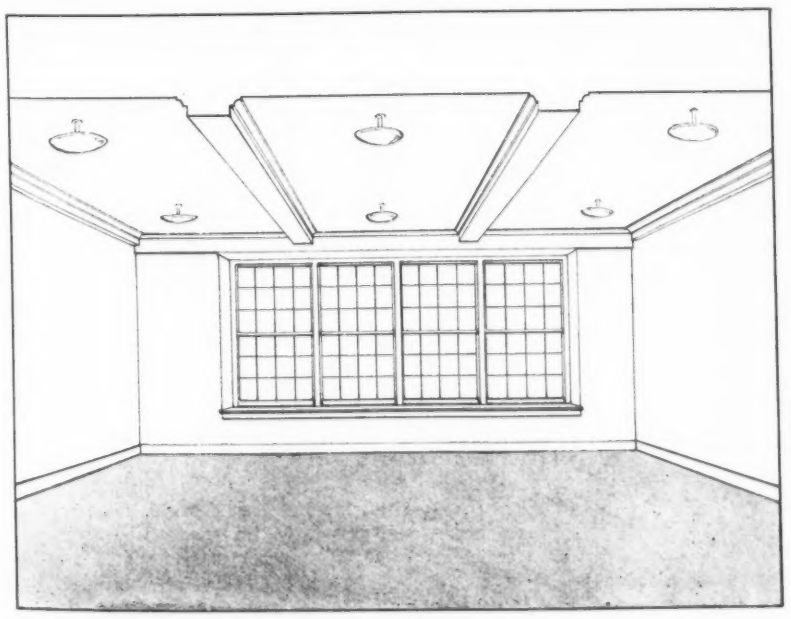
It is installed like the familiar wood-joist construction, gives a 2 in. concrete fire-stop and a flat plastered ceiling, but will not resist a hot fire, may not have an unlimited life, and will slightly raise insurance costs.

The gross saving with this type of construction is about $3,200, with an insurance penalty capitalized of about $1,900, or a net saving of only $1,300 over a fully fireproof job which is in no way less desirable, and in fire resistance and probable length of life more so. The saving is more apparent than real.

To effect a real cost reduction in floor systems, a more radical step is necessary and this points toward the elimination of plastered ceilings, possibly by the use of a concrete surface, obtained by a smooth form such as metal or plywood finished with cold-water paint. In this case, it might be difficult to entirely eliminate beam and secure a perfectly plane surface, and this feature would somewhat impair the light-reflecting qualities of the ceiling, but the appearance need not be less attractive, and neither maintenance nor insurance would be increased. The saving from such change would probably run from $3,500 to $5,500.

The use of a single coat of plaster called "yesso," applied directly to the rough concrete, is quite common in South America. This finish was used successfully by H. E. Coffin, architect, on the Girl's High School at Lima, Peru.

When we consider that wood-joist construction requires plaster and that there are available even lower-cost fireproof constructions than the types suggested above, it may be said that there is no saving to be made by using wood floors.



CLASSROOM WITH BEAMED CEILING OF UNPLASTERED CONCRETE PAINTED
Suggested by Robert R. Graham, Architect.

EFFECT OBTAINED BY THE USE OF STEEL MOULDED FORMS AND PAINTING WITHOUT PLASTER

JEFFERSON SCHOOL AT NEW ROCHELLE, NEW YORK
Starrett and Van Vleck, Architects, New York City.
Showing the Modern Trend in Exterior Design of School Buildings.

The standard exterior wall which best fulfills all its functions is still brick, with stone or facebrick exterior, with flashing at the floors, and a separate furring to carry the plaster.

Although a considerable amount of experimental work and even more discussion has been expended on the development of a cheaper and thinner wall material, to be manufactured in large panels and detailed to fit a steel or concrete frame, there is as yet no precedent for the use of this construction in school buildings. It is highly probable, however, that such a method of wall construction will be evolved within the next decade and will be extensively used, subject, of course, to the architectural designer's ability to treat it successfully.

Several other types of masonry walls have been devised as substitutes for brick with varying success.

The most obvious step to reduce the cost of the standard wall is the substitution of common brick for face brick. This would reduce the cost of the typical school described above by approximately $2,300, with no corresponding loss except in appearance.

The brick-faced, terra-cotta-tile wall has been extensively used, with and without furring, sometimes with complete success. Such a wall with common-brick face but no furring would, on the typical building, effect a substantial saving of about $5,400, over a solid wall with brick face. This type of wall depends for its strength and weatherproof qualities on first-class mason work with joints completely filled, and failing such workmanship, damaged plaster and finish are unavoidable. The addition of fireproof furring to this wall would minimize leakage but would cost $2,800 additional. Such furring would also provide insulation against cold walls thereby reducing heat losses.

Two other types of walls which have not been extensively used on schools are terra-cotta tile with stucco exterior, and reinforced concrete with rubbed or tooled surface. Each if well built is highly efficient as to strength and waterproof qualities, but both are used reluctantly by many architects in northern climates on account of the difficulty of obtaining first-class workmanship, and are subject to limitations in appearance and architectural treatment.

The concrete wall with furring to prevent condensation would reduce the building cost from the high standard by about $9,500, and the tile and stucco wall without furring by approximately $11,500. Neither of these substitutions should adversely affect insurance or maintenance costs.

There has been recently developed a molded gypsum plank partition finished with a casein stipple in place of plaster which would permit a saving of about $4,000.

A SUMMARY OF THE JUSTIFIABLE STRUCTURAL ECONOMIES OUTLINED ABOVE FOLLOWS

	Saving
I. Floors	
a) Omit plaster on ceilings and permit beams	$ 4,000
II. Walls	
a) Common brick with metal furring	2,300
b) Terra cotta tile faced with common brick, no furring	6,500
c) Terra cotta tile faced with face brick, no furring	4,200
d) "b" plus metal furring	3,700
e) "c" plus metal furring	1,400
f) Terra cotta tile faced with stucco, no furring	11,500
g) 8" Reinforced concrete wall with metal furring	9,500
III. Partitions	
a) Gypsum partitions finished with stipple in place of plaster	4,000

By using **I***a*, **II***f*, and **III***a*, a total reduction in cost of about $20,000 could be effected without any corresponding sacrifice in safety, permanence or insurance.

The foregoing figures on costs and insurance are naturally approximate only. They will vary widely in different localities and at different times. They do, however, represent fair, average conditions in upstate New York villages and small cities and are offered in the hope that they may aid those interested in modern educational plants in the attainment of a true perspective on the school-building situation as it exists today. There are, however, implications that point toward other developments in the structural field not covered in this article.

THE EDISON SCHOOL, PORT CHESTER, NEW YORK
Tooker and Marsh, Architects, New York City.
Showing effective architectural treatment with stucco.

WHERE SCHOOL ADMINISTRATION HAS WON

If there are any dark spots on the horizon as seen from the standpoint of the school interests of the United States there are also bright rays that gladden the picture as a whole.

The school system of Kent, Ohio, is one of them. The tax rate was reduced, but the schools go on in the usual way. There is no cessation of effort, no embarrassment, no closing of schools, nor radical slashing of school costs. The explanation is provided by Supt. W. A. Walls, who says: "We saw this thing coming on several years ago, and began to prepare ourselves to meet it, cutting our budgets each year wherever we could."

The community expressed its approval of the policy of the board of education recently by reëlecting the three retiring members, F. W. Bowers, I. R. Marsh, and George S. Getz, by an overwhelming majority. Mr. Bowers has been a member of the board for 31 years. Superintendent Walls has entered upon his fourteenth year of continuous service.

OAKLAND CREATES CHILD-WELFARE DEPARTMENT

Willard E. Givens, Superintendent of Schools

In August, 1933, the public schools of Oakland, Calif., created a Department of Child Welfare, to coördinate the administrative and supervisory functions which were rendered by the divisions of attendance, health and development, physical education, and individual life guidance. The purpose of the organization was to make as effective as possible, the service given by each of these divisions in conserving and improving the physical and mental health of the school children.

All modern school systems find it necessary to build up specialized administration and leadership to care for those phases of child development upon which wholesome living must rest. Parents expect the schools to share with them the responsibility for developing in children physical fitness, emotional balance and control, and reasonable social adjustment, as well as vocational adequacy.

It is the teacher in daily contact with children who actually contributes the major portion of the public school's share in this essential program. The principal, dean, and counselors in each school contribute leadership and support. The staff at the central office assists in arranging the administrative machinery; supplies specialized services of physicians, nurses, and supervisors of physical education, attendance, and experts in life guidance; coördinates the efforts of the several agencies; and arranges coöperative action with the other social agencies in the community. The real business of the Department of Child Welfare in the Oakland public schools is to lead and guide in the work of developing in all of the children strong, well-rounded, wholesome personalities.

The HIGH-SCHOOL Classroom

R. E. Green

The classroom is the fundamental unit of the high-school building. A study of the modern building reveals certain outstanding changes which have taken place in the many details of all types of classrooms. These changes have been brought about by greater knowledge of the needs of the classroom teacher and by recent progress in a school program which demands greater pupil activity. In addition to these developments, the educational administrator has gradually assumed a more influential part in the planning of school buildings. And so the classroom, as the most important unit of the building, is coming to be designed to fit a broad, socialized program of instruction. From general observation it may be said that the modern classroom is more compact, better lighted, equipped, better designed to fit the needs of pupils and their activities, better suited to a greater percentage of utilization, and more beautiful in design and decoration.

In order to ascertain more objectively the status of these particular phases of the high-school classroom, data have been collected from 125 of the largest high schools of the twenty North Central states. Each school was asked to select one of its best classrooms on which to report. It is confessedly the purpose of this investigation to point out the most desirable characteristics of classrooms. With this in view, the assumption has been made that the largest high schools could better furnish the most desirable data. Size of school should not affect the standards of the classroom. What is desirable in a classroom in a large school should be equally desirable in a small school.

The physical characteristics of the classroom are determined to some extent by the nature of the building as a whole, and by its type of construction. The American Institute of Architects groups buildings under the following types for construction:

Class A — A building constructed entirely of fire-resistive materials, including its roof, windows, doors, floors, and finish.

Class B — A building of fire-resistive construction in its walls, floors, stairways, and ceilings, but with wood finish, wood or composition floor surface, and wood roof construction over fire-resistive ceiling.

Class C — A building with masonry walls, fire-resistive corridors and stairways, but with ordinary construction otherwise.

Class D — A building with masonry walls, but otherwise ordinary or joist construction and wood finish.

Table I points out the trends in type of building construction during the past several decades. Of the 69 buildings constructed since 1920, all but one are of Type A or B, whereas 21 of the 56 constructed before 1921 were of Type C or D. This shows a strong trend toward the fireproof type of construction throughout. It may be concluded that this trend affects the type of classroom in no small way.

TABLE I. Number of High-School Buildings of Each Type of Construction Classified According to Year of Construction

Type Building	*Number Buildings Constructed* Before 1900	1901 to 1910	1911 to 1915	1916 to 1920	1921 to 1925	Since 1925	*Total Number Buildings*
A		3	4	4	15	9	35
B		6	10	8	24	20	68
C	6	2	1	2		1	12
D	4	3	2	1			10
Total	10	14	17	15	39	30	125

Number of Academic Classrooms. The distribution of the 125 high schools as to the number of pupils enrolled per academic classroom is shown in Table II. The number of pupils enrolled per academic classroom provided in the building ranges from 17 to 95. The median for the group is 38. This median is almost consistent in all groups up to 3,000 enrollment. For the group of largest schools, the median is 45. This may be accounted for by the fact that the larger schools provide more special rooms for more extensive curricular offerings, and thus require fewer academic classrooms.

TABLE II. Number of High Schools According to Enrollment Per Academic Classroom

Number Pupils Per Academic Classroom	*Number According to Enrollment* 750 to 1,000	1,001 to 1,500	1,501 to 2,000	2,001 to 2,500	2,501 to 3,000	Over 3,000	*Total Number Schools*
Less than 25	3	2					5
26 to 30	6	8	3	2	1		20
31 to 35		12	8	1	1	1	23
36 to 40	9	10	7	4	3	2	35
41 to 45	8	6	4	1	1	2	22
Over 45	2	6	2	3	2	5	20
Total Number Schools	28	44	24	11	8	10	125
Median*	37	38	38	39	39	45	38

*Computed from the original data.

Utilization. The subject of utilization of the school building may be considered from three points of view: room, pupil-station, or floor-space utilization. The data considered here deal with the room use. The principal reported the number of actual periods school is in session each week, and the actual number of periods the room is in use. Forty-five per cent of the rooms are utilized every period of the week; 32 per cent are utilized from 80 to 85 per cent of the periods. The mean per cent of utilization for the total number of rooms is 87. This shows a very satisfactory percentage of room utilization.

Location of Classrooms. Modern school buildings do not provide for classrooms on the basement floor. This is the case in 55 per cent of the buildings reported. Of those reporting rooms on the basement floor, nearly one third comment that they are special classrooms, such as shops. In no case is the number of rooms large. Ninety per cent of the buildings having basement rooms have three or fewer rooms on that floor.

Sixty-two per cent of the buildings have classrooms located on three floors. One building reports five floors and another six floors. The remaining are about equally divided between two and four. The 69 buildings constructed since 1920 show more desirable situations in these respects. In 95 per cent of this group there are no classrooms in the basement and in 82 per cent the classrooms are located on three floors.

Size of Rooms. The floor area of the classroom ranges from 384 to 1,292 square feet. The median area is 725 square feet. This fact in itself is not significant inasmuch as it is apparent that there should be rooms of various sizes to accommodate different-sized classes. However, only 45 per cent of the buildings make this provision. A much higher percentage of pupil-station utilization may be attained when rooms are provided with seating capacities varying in about the same ratio as the sizes of classes. Modern school buildings are apparently not yet recognizing this possible economy.

Table III shows the number of high schools providing various amounts of floor space per pupil. The mode is plainly 15 to 17 square feet per pupil; the median for the group is 16.7 square feet. There is no significant diffearence in the amount allowed per pupil in the various-sized schools.

In this same connection may be pointed out the numbers of pupil stations in the classrooms. The modal number of pupil desks or chairs is 35; this number is found in 37 per cent of the

TABLE III. Number of High Schools According to Enrollment Allowing Various Amounts of Floor Space in Classrooms Per Pupil

Number Square Feet Per Pupil	*Number According to Enrollment* 750 to 1,000	1,001 to 1,500	1,501 to 2,000	2,001 to 2,500	2,501 to 3,000	Over 3,000	*Total Schools*
Less than 15	2	1		1	2	1	7
15 to 17	11	25	13	5	3	5	62
18 to 20	9	11	8	2	2	3	35
21 to 23	2	6	3	3	1	1	16
24 to 26	1	1					2
More than 26	3						3
Total Number Schools	28	44	24	11	8	10	125
Median*	18.1	17.2	17.2	17.8	15.2	16.8	16.7

*Computed from the original data.

classrooms. Thirty stations are found in 32 per cent and 40 in 15 per cent of the rooms. The number reaches as high as 50 in 3 per cent. Only one school reports as few as 25 pupil stations in the classroom.

The typical number of cubic feet of air space in the classroom is found to be 8,700. This is an average of approximately 250 cubic feet of air space per pupil for the typical room. The median height of classrooms is 12 feet. This is also the mode, since it occurs in 62 per cent of the classrooms. It is quite evident that the newer buildings show a tendency toward lower ceilings in classrooms. Not a single building constructed since 1920 is reported to have classrooms of greater height than 12 feet.

The ratio of length to width has been determined for each room. In no case is the room reported to be square. There is a wide variation among the ratios. However, the ratio of 5 to 4 predominates. The ratios, 11 to 9, or 10 to 9, are frequent.

Floors. Table IV summarizes the items of room construction. Hardwood flooring is found in 45.6 per cent of the rooms. Battleship linoleum over cement is reported in 48 per cent of the rooms. The particular advantages of a fireproof floor covered with linoleum are (1) elimination of noise, and (2) sanitation.

TABLE IV. Number of High Schools According to Enrollment Having Certain Room Specifications for Classrooms

Item	750 to 1,000	1,001 to 1,500	1,501 to 2,000	2,001 to 2,500	2,501 to 3,000	Over 3,000	*Per Cent of Total*
Slate Blackboard	22	41	20	10	8	10	88.8
Automatic heat control.	20	42	20	8	6	10	84.8
Battleship linoleum ...	11	22	10	6	3	8	48.0
Glass-paneled doors	11	19	12	6	5	6	47.2
Adjustable desks	7	16	12	10	6	7	46.4
Hardwood floors	15	21	11	3	5	2	45.6
Unilateral lighting	12	11	12	6	5	6	41.6
Movable desks.	8	11	13	7	5	6	40.0
Adjustable shades	7	10	6	5	5	8	32.8
Indirect artificial lighting	8	9	7	4	3	7	30.4
Per Cent having all...	43.2	45.9	51.2	59.0	63.7	70.0	50.5

Walls. The typical color scheme for the classrooms is as follows: walls light buff, ceilings white or extremely light cream. A small number report light-green walls. In 92 per cent of the rooms pictures are found on the walls.

Doors. School administrators favor a single door in the classroom, since 82 per cent report the single door; 16 per cent report two doors. While there is the argument that two doors facilitate passing of classes, yet a single door enables the teacher to have more complete control over the pupils in passing. Forty-seven per cent of the doors have glass panels.

Windows. Unilateral lighting is provided in 41.6 per cent of the cases, according to Table IV. In the remaining cases windows are reported on two sides of the room. In 85 per cent of the rooms the windows are on the pupil's left. The median number of windows is four, that number being reported in 82 per cent of the rooms. In all cases plain glass is used.

Buildings lack uniformity in the matter of ratio of glass to floor area. While the median ratio is 1 to 5, the ratios range from 1 to 12 up to 1 to 3. Forty-two per cent of the cases provide the median ratio.

The window shades are translucent in 88 per cent of the rooms. The typical colors are yellow, buff, or tan. Thirty-two per cent of the rooms have shades hung so that they are adjustable from both the top and bottom of the window.

Artificial Lighting. The typical classroom of these largest high schools is not so well lighted artificially as the ordinary barber shop. In the former case two electric outlets are provided for the entire room of 35 pupils. In 38 per cent of the cases four outlets are provided and in 9 per cent more than four. The total number of classrooms is practically evenly divided between the direct, the indirect, and the semidirect type of fixtures.

Blackboards. Eighty-eight per cent of the classrooms are provided with slate blackboard. The remaining have composition board. The average number of square feet of blackboard provided is 176. Forty-eight per cent of the rooms report that they have boards on three sides of the room. Practically the same percentage have boards on only two sides. Eighty-eight per cent of the classrooms have the chalk rail 36 inches above the floor. Removable chalk trays are provided in 78 per cent of the rooms.

Equipment. The bulletin boards are reported in 88 per cent of the rooms. Cork is the prevailing material, since 82 per cent of the bulletin boards are of this type. Other material reported includes composition, plaster board, cloth, and wood. The average number of square feet of bulletin-board space is 17. This is typically a board 3½ feet wide and 5 feet long.

The electric systems are essential in a well-organized high school. The electric clock is provided in 68 per cent of the cases, and the electric bell system for calling classes is found in all but one of the schools. Telephone, presumably the intra-communication system, is found in 52 per cent of the classrooms.

The radio is at present receiving considerable attention as an aid in teaching. According to the reports, however, only one school, and that an Ohio school, has installed a radio in the high-school classroom. Twenty-two per cent of these classrooms have provisions for stereopticons.

Pupil desks are typically individual and not movable. Sixty per cent are fastened to the floor. In those cases in which the desks are movable,

(Concluded on Page 56)

How *Old School Buildings* May Contribute to *Decreased Taxation*

An Important Solution of the Problem will be the Conservation and Modernization of Existing Educational Properties rather than the Building of New Ones

W. Fred Dolke, Jr., Architect and Engineer, Chicago, Ill.

The American nation, as one of the characteristics of its rapid and unparalleled growth, has been *new-building minded*. Old buildings have drifted backward swiftly in the public esteem under the demand for the new and better. Previous to the present time, the fulfillment of this demand for new, up-to-the-minute structures has been made possible by the ease with which capital wealth has been produced during successive decades of growth.

The new-building complex has caused a rapid rate of obsolescence in every type of structure. Coupled with it has been an unprecedented development during the past fifty years in every detail of the design, arrangement, construction, and mechanical development of buildings. This also has increased the rate of obsolescence. Finally, the rapid and often revolutionary changes in our economic and social conditions, in our methods and living standards have contributed to building obsolescence.

In other words, progress to which we in America are so definitely and so rightfully attached, has exacted a tremendous economic toll. Every well-built structure has had a possible and a probable physical existence far in excess of its profitable and useful life. In all fields of endeavor, buildings designed for particular purposes under given schemes of use have in relatively few years lost their suitability because, while the general purpose remained the same, the objectives and the methods of the activity they served have undergone such radical changes that the buildings have become obsolete with great rapidity.

School-Building Obsolescence

Such progress has been evident in educational work, especially in the past thirty years. The organization of schools, the methods and objectives of teaching, responding to the demand of social, economic, and civic changes, have been radical and have affected the plan, the construction, and the equipment of school buildings. New types of schools have been established, diversified curricula and activities have been introduced, there has been an increased dependence of education upon the school buildings and their equipment, the need for social centers in large and small communities has been met by opening school buildings to adults. The rapid development of the junior high school, the increased emphasis upon physical education, the growth of vocational education and industrial-arts work, the new emphasis upon homemaking, are all developments that have aided to make old school buildings obsolete. Some of this obsolescence has not been altogether real and will be shown later.

The continued use of old school buildings resulting in the growing loss of true educational efficiency is a highly complex problem. Obsolescence is an inherent difficulty of our intricate economic life whose main characteristic is rapid change. In the past this problem has been solved more easily because communities have been wealthy enough to be able to scrap buildings worth thousands of dollars and to pay for new ones many times larger and more expensive. Obsolescence, as one authority has expressed it, is "a measure of luxury or of economic extravagance." This luxury of the desertion or destruction of old buildings in favor of new ones cannot be continued indefinitely. We cannot afford it right now. Who can say that we shall be able to afford it in the future.

Economists appear to be agreed that we have reached an end of a remarkable period of development and expansion and that we will now proceed to consolidate and define our present achievements as a basis for future progress. We can expect further technological advances, other and perhaps more startling changes in fundamental ideas and methods, but certainly not such tremendous opportunities for the rapid accumulation and expenditure of wealth as we have had in the past hundred years.

Lot of Good in Old Building!

Already, out of the welter of confusion brought on by the depression, economic pressure is forcing new alignments and new policies. The phase of this intensive influence most pertinent to the problems and work of school boards is the insistent demand for reduction of taxes. The whole tax situation — rightfully in many political quarters but probably unjustly in the majority of educational subdivisions — is undergoing a storm of criticism and investigation, and intense economy on the part of public officials will be the order of the day.

In addition, a change in the traditional attitude of the people, in their former eager willingness to scrap the old and buy the new, seems to be coming to pass. If present indications mean anything, the people will be definitely averse to heavy financial commitments for new buildings and public works, not only from opposition to fancied or real increases in taxes, but more because they have learned in this economic crisis that, to use a popular phrase, "there is still a lot of good in the old car." Their thoughts have been turned away from the old luxury of desertion or destruction to a new policy of better utilization of existing values. We are entering a new age, a new phase in American life, the intensive conservation of property and of all tangible values.

There can be little doubt, as a certainty, that the American people will continue to demand the best for their children. While they will oppose heavy bond issues for new work, they will be willing and able — as I shall illustrate later — to finance small borrowings for the remodeling, the rebuilding, the modernizing of existing structures. It is this fact that offers an opportunity to school boards to solve some of the problems which have arisen from the rigid retrenchments required everywhere. It is certain that good policy will dictate all possible economies in building construction, business management, and operating costs, before there shall be any curtailment of educational programs. In many communities there will have to be pigeonholed existing schemes for new structures to replace unsatisfactory school plants and serious thought given to the feasibility of modernizing these existing buildings in a successful and satisfactory manner — economically as well as pedagogically.

Intelligent Modernization Possible

Just as we must admit that these educational plants are open to the attacks of time and obsolescence, so we must recognize the opposite condition, that they are open also to possibilities of being intelligently modernized and improved. Frankly, not all obsolete buildings are worth reclaiming; but there exists in this country today many schools thought of as obsolete which can be modernized, which with expert study can be turned from liabilities into assets, at costs much below the level for totally new equivalent structures. Wrong location is not considered in this discussion; however, inadequacy is.

The problem of school-building modernization in its broad aspect is much simpler than it appears at first, because there has been little change in the most significant fundamentals in school design, the size and general relationship of classrooms, in the past thirty years. A school building erected within this period and fundamentally well designed in its general layout remains fundamentally well designed today.

The factors which have had the greatest influence in bringing about a state of obsolescence

have originated principally in the detail manner of effecting an enlarging educational program, such as increased administrative duties, more intensive health supervision, new subjects and new methods requiring special facilities, enlarged kindergarten programs, classes for retarded pupils, improved physical education and sport activities, greater emphasis on music and dramatics, the introduction of the platoon and similar forms of organization, and other growths in the educational procedure. Now the important point, one not always recognized or understood, is that not one of these items is of such character in its main physical requirements as to be impossible of inclusion in or addition to an existing building. Careful expert study will achieve results comparable to those anticipated in an entirely new building and certainly at much lower cost.

A second cause of obsolescence has arisen from the tremendous improvements made in the mechanical equipment for heating, ventilating, and sanitation. However, such equipment usually has to be replaced in about twenty years because of natural depreciation; in any event the improvement of existing equipment is a detail routine affair presenting few difficulties under expert attention.

Other Factors of Obsolescence

Other factors which tend to make an older building obsolete are higher standards, such as for natural and artificial lighting, better facilities for storing pupils' clothing together with means for drying them and removing odors, more liberal provision of in-built cases, shelves, lockers, lavatories, and similar equipment to serve the changing needs and convenience of teachers, the addition of radio-receiving systems, moving-picture apparatus, and such modern aids to education. Here again there is nothing that presents an insurmountable obstacle. Just how these improvements shall best be made in an older school is a local problem, not beyond expert ingenuity.

Finally, many school buildings *appear* to be obsolete because of lack of architectural character or beauty. It is a truism that any building having fundamental architectural beauty remains always beautiful, always interesting, always stimulating. Age softens such beauty but never presents that aspect of "oldness" and "out of style" which is a characteristic of obsolescence. A building without such fundamental beauty has no inherent interest and particularly looks bad in comparison with new buildings. Even though it may be perfectly satisfactory in its suitability to its purpose its appearance tends to create a feeling that the building should be abandoned. This type of obsolescence is most difficult to attack. Sometimes simple means will accomplish a better appearance; frequently such a major operation must be performed to secure desirable results that considerable expense is involved.

Interior appearance, most fortunately, can be tremendously improved, simply and economically, because probably nothing produces such satisfactory effects for relatively small expenditures as an intelligent scheme of redecoration. Moreover it is usually the decorative effect that produces the greatest volume of comment from the public, since it is the most striking visual evidence of improvement. Dingy, varnished woodwork can be given a completely new aspect, new life and snap, through a judicious use of color. A change of tones and shades from room to room, and even within rooms, brings new joy and interest through variety and through the stimulation that always comes from color properly used. Likewise the addition of a few architectural details carefully and expertly selected will take away from corridors and other spaces that drab, uninteresting, depressing appearance which is commonplace in so many existing schools. It is so simple to convert barrenness and repellant elements into pleasurable and stimulating surroundings.

TABLE I. Principles for Judging Remodeling Problems

	Reasons which support remodeling.	*Reasons making new structure preferable.*
1. Site.	Satisfactory.	Has become unsatisfactory.
2. Structural condition.	Good.	Poor, repair costs high.
3. Meets code requirements.	In general, yes.	No. Under criticism from authorities.
	No serious difficulty.	Desirable changes difficult and expensive.
4. Safety.	Construction fire-resisting. Safety features satisfactory, or improvement possible.	Unsatisfactory. Changes difficult and expensive.
5. General arrangement.	Satisfactory.	Unsatisfactory. Changes difficult.
6. Desired improvements.	Can be secured with little difficulty.	Considerable change necessary.
7. Extensions.	Can be made readily.	Impractical and expensive.
8. External appearance.	In general good, or can be readily improved.	Not good. Difficult and expensive to improve.
9. Cost.	Cost of proposed changes much less than equivalent new building.	Cost of proposed changes too nearly equal to cost of new building.

An Experience

Now, in the light of this discussion, does the idea of reclamation, of modernization, appear such a formidable affair? I want to illustrate how simply and systematically a program can be organized and carried out by describing briefly an experience with a school in Two Rivers, Wisconsin, in 1931.

The major portion of this building consisting of twelve classrooms and an auditorium had been erected in 1908. Five rooms and a new heating plant were added in 1921. For some time there had been growing up among the parents a feeling of dissatisfaction with conditions at the school, centering principally on the lack of ventilation, inadequate sanitary facilities, and poor provision for handling the pupils' clothing, culminating with the organization of a committee to investigate the situation.

In my study of the problems the investigation was broadened so that the report — a typewritten document of ninety pages — included every detail in which the school might be modernized or unsatisfactory conditions remedied, discussed as regards every alternative method of procedure, including comparative estimates of costs. The possible conversion of the auditorium space into a junior high school was even considered, to make the investigation complete in every way, although it was known that this part of the program could not be accomplished at that time.

It must be clear that no fixed rules can be laid down to decide when a building should be remodeled and when it should be replaced. This is a subject to be studied carefully and thoroughly for each individual project, and always with expert, unbiased assistance. However, there are certain economic principles which can be set up as a basis for comparison whenever the choice between modernization and replacement presents itself (see Table I).

Experience indicates that an economic study of the property in question is the logical beginning point. This should determine, first, the true needs of the school, to set up an ideal which it would be desirable to obtain. Then it should concern itself with the existing physical character of the property, stability of walls and floors, condition of existing mechanical equipment and of all the various features of the building, the cost of placing the property in the best up-to-date condition (all this is, in reality, to overcome depreciation rather than obsolescence), and the practical limit of alterations under reasonable warranted expense. Finally there follows the studies to determine what can be accomplished within the limits set by the existing structure to achieve as many as possible of the changes and improvements outlined in the economic survey, all accompanied by detailed estimates — not guesses — of cost.

Analysis of a Job Needed

Any project for alteration or modernization must be viewed as comprising a number of individual changes or additions, often more or less unrelated to each other. When the work is thus broken down into its component parts, each discussed thoroughly in all its ramifications and each estimated separately, it is then a simple matter for a school board to choose those which it will be able to carry out within the limit of available funds. By following such a procedure a school board can consider a specific plan of operation and compare the advantages and disadvantages of a program of modernization at a determined cost with the recognized advantages of a new building at a much larger expenditure.

When modernization is adopted, a program must be arranged so all work can be completed during the summer vacation. An accurate building survey is absolutely essential to reduce the danger of unforeseen contingencies. Complete drawings and specifications are much more important in remodeling than in new work, because items not shown or specified to be changed are assumed to remain. Coördination between various trades is harder to control than on new work and must be specially detailed in the specifications and supervised on the work.

In the 1932 national conference on the new crisis in education brought on by the alarming decrease in funds for current educational needs, school boards were warned "to adjust school costs to long-term economic conditions with no damage to the child through all grades of schooling," and that "we dare not let our economizing encroach upon our schools' development of the child's citizenship." It is a tremendous problem. The school plant must be maintained at its best efficiency if the entire educational program is to succeed. In many localities America will have to turn its back on new school construction. Modernization, in its complete aspect, offers a solution of one of the critical economic and educational problems of the day.

The Law Governing *the Making of Contracts for the* Construction *of* School Buildings

Arthur E. Traxler

When a board of education wishes to erect a school building on a site that it has selected and purchased, the logical steps for it to take are to have plans and specifications of the building drawn up and approved and to let the contract for the work of construction. If boards are allowed unlimited authority to enter into contracts, opportunities are opened to occasional unscrupulous persons for individual favoritism and personal profit at public expense. The statutes of most states, therefore, prescribe rather definite modes of procedure for boards of education to follow in letting building contracts. Thus, it is customary to require them to receive bids from contractors and to let the contract to the lowest responsible bidder. When the law states that building contracts must be made in this fashion, they can be made in no other way. Contracts made without conforming to statutory regulation are *ultra vires*, and the principle that such contracts are unenforceable is so well established that discussion of it would be superfluous.

Although the manner in which boards of education may enter into building contracts is quite generally defined in the laws of the various states, an impressive number of cases in which the validity of the mode of letting contracts was at issue have come before the courts. Certain questions have been raised with more or less frequency. It is the purpose of this article to present the court decisions relating to the most important of these controversial issues.

Contracts for Architect's Services

It is not uncommon for a statute to read somewhat as follows: "All contracts made by a board of education except teachers' contracts and those for professional services, in excess of five hundred dollars, must be awarded to the lowest responsible bidder after public notice has been given for a period of not less than ten days." Now, a school board wishes to employ an architect to draft plans for a high-school building. The board wants a competent man and knows that his services will cost the district more than five hundred dollars. Must the board advertise for bids and hire the architect who submits the lowest bid, or may it proceed independently and employ the man whom it thinks best for the job? In New York, North Dakota, Tennessee, and Minnesota, boards of education who took the latter course had their right to do so argued in court. In every case the court ruled that the board acted within its authority.[1] The courts reasoned that contracts with architects are contracts for professional services and that they may be made in the same way as those with teachers, janitors, and others who render personal service to the school. On grounds of reason alone, it appears that such a position is a wise one. Boards of education are required to receive bids on certain contracts in order that public monev may not be wasted. Obviously it would be false economy to compel school districts to accept the services of an architect who would work cheaply when perhaps the quality of his work would be far inferior to that of a higher-priced architect.

Letting Contract when Sealed Proposals are Required

State laws do not always expressly require that a board which proposes to construct a new school building advertise for bids on the contract. In some cases, they merely state that sealed proposals shall be received before the contract is let. According to a decision of the New Mexico Supreme Court in a case where a board received sealed proposals and let a building contract without advertising for bids, a statute of this kind implies that the board shall advertise for bids. Said the court:[2] "It is urged that this statute did not in language require any advertisement for bids, but we cannot agree with this contention. . . . We are clearly of the opinion that this statute required competitive bidding, based upon plans and specifications, and to attain that end some reasonable public notice was required and is to be implied from the nature of the statute."

Bidding on Indefinite Specifications

When boards of education advertise for bids on a building contract, it is necessary for them to place at the disposal of all bidders a copy of plans and specifications for the bidding. If these specifications do not set forth the thing to be done with definiteness the bidding may be influenced by the fact that the prospective contractors differ in their understanding of what is expected of them. The supreme courts of three states have held that a valid contract does not exist if it results from competitive bidding based on specifications that are lacking in clarity.[3] In deciding one of these cases the supreme court of Pennsylvania, quoting in part from McQuillan on *Municipal Corporations* pointed out the items that should be included in setting up a common standard of bidding. The court said: "That bidders may put in their bids on a common basis they should be informed by the advertisement or the specifications on file of: (1) the quantity or amount of the work or supplies, whenever it can be specified; (2) the time within which the work is to be finished or the supplies furnished; (3) the manner in which the work is to be done; (4) the quantity of the materials, if any, to be furnished; and (5) any other matter necessary to enable bidders to bid intelligently."[4]

Contracts with a Higher Bidder

Statutes relating to contracts for school buildings usually say that they shall be let to the "lowest responsible bidder" or to the "lowest and best bidder." Do the courts hold that it is the intent of the law to vest the board with the right to exercise its discretion in awarding the contract, or is the lowest bidder automatically entitled to the contract? The answer to this question obviously depends on the importance which the courts attach to the words "responsible" and "best."

An examination of six cases bearing on this point indicates that the courts are unanimous in their opinion that a building contract need not, of necessity, be awarded to the lowest bidder.[5] The reasoning of the courts in this connection is well brought out in the case of *Ellingson* v. *Cherry Lake School District,* in North Dakota. Said the court: "If the legislature had intended that the contract should in every case be let to the lowest bidder, it would doubtless have said so. What the legislature did say was that the school board should let the contract to the lowest responsible bidder. The very terms of the statute imply that a school board or other governing body shall determine the responsibility of the several bidders and award the contract to the one found to be the lowest responsible bidder."[6]

But if a board is not required by law to award the contract to the lowest responsible bidder without taking into consideration his other qualifications, neither may the board "capriciously select a higher bidder regardless of res-

[1] *Rosatti* v. *Common School District No. 96, Cass County,* 204 N. W. 833, 52 N. D. 931; *People ex. rel. Kiehm* v. *Board of Education of City of Utica,* 190 N. Y. 798, 198 App. Div. 476; *State* v. *Brown,* 21 S. W. (2d) 721; *Krohnberg* v. *Poss,* 244 N. W. 329.

[2] *Mays* v. *Bassett,* 125 P. 609, 17 N. M. 193.

[3] *Hannon* v. *Board of Education of City of Lawton,* 107 P. 646, 25 Okla. 372, 30 L. R. A. (U. S.) 214; *Edmundson* v. *Board of Public Education of School District of City of Pittsburgh,* 94 A. 248, 248 Pa. 559; *Warnock* v. *Wray,* 194 N. Y. S. 396.

[4] *Edundson* v. *Board of Public Education of School District of City of Pittsburgh,* 94 A. 248; 248 Pa. 559.

[5] *Bowers* v. *Board of Education,* 2 Pears. 227; *State* v. *Board of Education of City of Fond du Lac,* 24 Wis. 683; *Schwitzer* v. *Board of Education of City of Newark,* 75 A. 447; 79 N. J. Law 342; *Ellingson* v. *Cherry Lake School District,* 212 N. W. 773; *Hibbs* v. *Arensberg,* 119 A. 727, 276 Pa. 24; *In re Summit Hill School Directors Removal,* 137 A. 143, 289 Pa. 82.

[6] *Ellingson* v. *Cherry Lake School District,* 212 N. W. 773.

BOYS' GYMNASIUM, POTTSVILLE HIGH SCHOOL, POTTSVILLE, PENNSYLVANIA

The gymnasiums are placed on the upper level. The boys' gymnasium above has a 65 foot by 90 foot clear floor and two spectators' galleries, seating 600 each. It gives access to the 8-acre field, has direct outside entrances and is lighted from three sides. Note acoustical treatment of ceiling.

ponsibility or cost."[7] How, then, may a board make a valid contract with a high bidder? The Pennsylvania Supreme Court has given a clear answer to this question: "What the law requires is the exercise of a sound discretion by the directors. They should call to their assistance the means of information at hand to form an intelligent judgment. They should investigate the bidders to learn their financial standing, reputation, experience, resources, facilities, judgment and efficiency as builders."[8]

It is worth noting in this connection that, if a contract is made with one who is not the lowest responsible bidder, courts will not always heed a petition of the low bidder that the contract be awarded to him. The courts reason that the real purpose of the law is to protect the public rather than to do justice to worthy, but unsuccessful, bidders.[9]

Reservation of Right to Reject Bids

In states where the board is not required by law to let building contracts to the lowest responsible bidder, the general rule is that the board may not be restrained from contracting with one who is not the lowest and best bidder, even though it advertises for bids and thus leads others to believe that it contemplates a contract with the lowest of the bidders, provided that it reserves the right in its notice to reject any and all bids.[10] Relative to a case of this kind, the Michigan Supreme Court said: "The board expressly reserved the right to reject any and all bids, and in the rejection of the complainants' bid they were acting within the right reserved by the notice. The board has a discretion in the matter and there is no evidence that it was abused."[11]

It may happen that in a state where the law requires contracts to be awarded to the lowest responsible bidder, a board of education who has advertised for bids on a contract for the construction of a school building is not satisfied with any of the bids and wishes to reject all of them and to readvertise the contract. The New York court has stated in the case of *Arensmeyer-Warnock-Zarndt, Inc.* v. *Wray*[12] that a board may not do this, unless there is some substantial reason for so doing. Said the court: "Under the statute requiring the contract to be let to the lowest responsible bidder, all the bids cannot be rejected unless there is some substantial reason therefor. This provision was inserted in the statute for the purpose of protecting the public, and if the board can reject bids arbitrarily, it will open the way to favoritism, corruption, extravagance, and improvidence. . . . It would afford an easy way to keep on bidding until a favorite contractor was the best bidder. The board is required to act in good faith, and if the proceedings appear to indicate some ulterior motive, the courts will interfere."

What Constitutes a Contract

It is sometimes of considerable importance to know when a contract that results from proposals placed on specifications for a building takes place. Cases have come before the supreme courts of Minnesota and Iowa in which it was contended that, when a board has examined the proposals submitted and has decided upon the successful bidder, a binding contract is created between the board and the bidder. Both courts held that such action did not result in a contract.[13] The courts reasoned that there must be a meeting of the minds in this type of contract, as in other types, and that in order for this meeting of the minds to take place an unqualified acceptance must be communicated to the bidder.

Changes in Specifications

It may happen that after the members of the board have selected the lowest responsible bidder they wish to enter into an agreement with him concerning certain changes in the specifications which they believe to be desirable. May they do this, or must they readvertise for bids if they want to make changes? Four state-supreme-court decisions have been rendered on this point.[14] The consensus of opinion has been that where the changes in the specifications were minor ones and did not affect the general nature of the contract, such changes could be made without rendering the contract invalid; but, if large alterations were made which had an important effect on the agreement between the parties, then the contract was void. For example, in deciding a case that came up in the State of Washington, the court said:[15] "The board of education may not call for bids upon a given plan, and, after bids have been made thereon, so change the plan as to make an entirely different building, and require bidders to accept a contract upon the plan so changed. Nor may the board enter into private negotiations with one of the bidders upon a different plan. This would avoid the statute. But, where the plan remains substantially the same, and the parties act in good faith, detail features, which are not necessary to the building, and which do not change the substantial character of it, may be eliminated on terms agreeable to the board and the bidder entitled to the contract upon the plans as advertised. Where a proper deduction from this bid is made on account thereof, such a change in the specifications would not be *ultra vires* of the board."

Erroneous Bids

Should relief be granted to a bidder who has made an error in his bid on a construction contract? This question seldom comes up in connection with a contract for a school building, but whenever it does arise litigation is likely to result unless the parties know what the position of the courts has been in cases of this kind.

In a case that came before the Supreme Court of Pennsylvania, the court decided that where a bidder discovered an error in his figures after he had placed a proposal on a contract and sent a corrected bid before the other bids had been opened, which bid, although higher than the first one, was still lower than any of the others submitted, the board should be restrained when it rejected his bid and sought to carry out a contract with a higher bidder.[16]

If, however, a bidder does not discover his error until after the bids are opened, and if he is found to be the lowest responsible bidder and is awarded the contract, which the board insists he should carry out, there are three courses open to him. He may go ahead and execute the contract and take whatever loss his error has caused him; he may refuse to carry out the contract and forfeit the amount that he deposited with the board when placing the bid; or, he may decline to go ahead with the contract and then enter a plea with a court of equity that the contract be set aside and his forfeited check returned to him. Three cases in which the contractor took the last-mentioned course have come before state supreme courts. In all of them the contractor was granted relief from his contract.[17] The courts have reasoned that if one places a bid on a construction contract, he does it on the basis of figures dealing with cost of materials and labor plus a certain profit which is rightfully his. If he then makes a mistake in his figures so that his profit will be impaired or even so great that he will suffer actual financial loss if he undertakes to fulfill the contract, the courts hold that there is not an *aggregatio mentii*, not a meeting of the minds, and, therefore, there is no binding contract.[18]

Bringing Action for Illegal Contract

Taxpayers who wish to bring action against a board for letting a building contract in an illegal manner should do so within a reasonable length of time. The Massachusetts case of *Con-*

(Concluded on Page 57)

[7] *Hibbs* v. *Arensberg*, 119 A. 727, 276 Pa. 24.
[8] *Ibid.*
[9] *State* v. *Board of Education of City of Fond du Lac*, 24 Wis. 683.
[10] *Chandler* v. *Board of Education of City of Detroit*, 104 Mich. 292, 62 N. W. 370; *Coward* v. *City of Bayonne*, 51 A. 490, 67 N. J. Law 470; *Moore* v. *Same*, Id.
[11] *Chandler* v. *Board of Education of City of Detroit*, 104 Mich. 292, 62 N. W. 370.
[12] *Arensmeyer-Warnock-Zarndt, Inc.* v. *Wray*, 194 N. Y. S. 398, 118 Misc. Rep. 619.
[13] *Cedar Rapids Lumber Co.* v. *Fisher*, 105 N. W. 575, 129 Iowa 332; *Smith* v. *Independent School District No. 12, St. Louis Co.*, 122 N. W. 173, 108 Minn. 322.
[14] *Criswell* v. *Board of Directors of Everett School District No. 24*, 75 P. 984, 34 Wash. 420; *Scola* v. *Board of Education of Town of Montclair*, 71 A. 299; 77 N. J. Law 73; *Hibbs* v. *Arensberg*, 119 A. 727, 276 Pa. 24; *Lehigh Coal and Navigation Company* v. *Summit Hill School District*, 137 A. 140, 289 Pa. 75.
[15] *Criswell* v. *Board of Education of Everett School District No. 24*, 75 P. 984, 34 Wash. 420.
[16] *Zimmerman* v. *Miller*, 85 A. 871, 237 Pa. 616.
[17] *School Commissioners* v. *Bender*, 36 Ind. App. 164, 72 N. E. 154; *Kutsche* v. *Ford*, 192 N. W. 714, 222 Mich. 442. *Board of Regents of Murray State Normal School* v. *Cole*, 273 S. W. 508, 208 Ky. 761.
[18] *School Commissioners* v. *Bender*, 36 Ind. App. 164, 72 N. E. 154.

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THE AMERICAN
School Board Journal

EDITORS:

WM. GEO. BRUCE WM. C. BRUCE

School Administration—What is Ahead?

THE story of America's system of popular education has been one of modest beginnings, splendid struggles, and remarkable achievement; in brief, colorful, fascinating, and in spots even tragic, but in its entirety wholesome in growth, progressive in tendency, and beneficent in service.

The thoughtful school administrator of today, school-board member, and superintendent, finds himself in a period of that story where he must have in mind the experience of the past, estimate the situation which presently confronts him, and in the light of past and present contemplate the future. His mastery over the factors within his control is on trial. He is dealing with a transition period.

While the situation, which at the present time confronts the American schools, is involved and in some respects perplexing, it lends itself to an adjustment. Calm, cool-headed, and circumspect deliberation will clarify every problem and in every instance suggest the solution.

The objective to be borne in mind is the preservation of the school system. The sources of support have been impaired. The causes here are obvious. The decline in property values and incomes has reduced the public revenues. Consequently, a smaller proportion of the income can go to the support of the schools.

At this point, it might be argued that the decline in the public revenue is due to a defective system of tax tribute. It may be argued that the management of school finances has been unwise. Finally, it may be claimed that the era of expansion in the educational field has gone beyond the limits of expediency and reason.

The immediate problem nevertheless centers upon the adjustment of the maintenance and operation of the schools with the finances in hand and those within reasonable expectation. Funds cannot be expended which are not at the command of the administrator. The budget must be balanced.

If the modern board of education is facing the test of service, and thus justify its being, it exerts a high order of educational statesmanship. It must demonstrate that it is equal to the situation which primarily means that it must utilize the available dollar in obtaining the maximum of service. It will uphold the integrity of the nation's system of popular education.

Parallel with that effort must go a study of the sources of public revenue. If the system of taxation out of which the schools derive their support, is inadequate and inequitable, it will remain for public sentiment to be educated in the right direction. Where a school system has been expanded beyond the lines of expediency and exigency, the process of curtailing and retrenchment is inevitable. The new deal idea has advanced sufficiently to demonstrate that the same American genius which has reared a remarkable structure in the field of popular education is fully capable of preserving that structure by meeting new problems with new solutions. The adjustments are well in hand.

Federal Financing of Schoolhouse Construction

IT WAS a splendid stroke of enterprise on the part of the Federal Government to finance building projects in the cities, counties, and villages throughout the United States and thus afford employment and relieve somewhat the existing distress. The sum of $3,300,000,000 was allocated and divided between local and federal projects.

It was believed that the school authorities of the country would come forward and request aid in new building projects. The latest figures at our command note that 1,498 schoolhouse projects involving the sum of $34,512,998 were approved by the federal authorities. This constitutes 5.75 per cent of the total allotment for non-federal projects.

There was an apparent hesitancy here and there to apply to the federal authorities for aid in carrying out needed schoolhouse projects. While the 30-per-cent grant proved attractive, the conditions attached to the same also brought some discouragements. The wage code was usually much higher than the locality had been accustomed to pay. In fact, in many instances the entire grant would be absorbed in a higher wage scale.

On the other hand, there were localities where a school-bond issue failed when submitted on the ordinary basis, and when presented with prospect of federal aid was favorably voted. In the larger cities the wage scale was already sufficiently high to meet the government code. In the smaller centers of population this was not the case. Thus, while a number of school-bond issues were voted down, there were, nevertheless, a number of building projects which received the approval of a local constituency. While the total is lower than it has been in some years, it notes the fact that many localities are in a sound financial condition.

On the whole, it may be stated that the idea of applying for federal aid does not find ready or general acceptance. It is believed that federal support carries with it federal control. The American idea of keeping the government of the schools upon a decentralized basis, namely, under the control of the people, is not readily shaken. Where the government dollar goes there goes also the authority to determine how it shall be spent.

It must be conceded that the aid extended by the government will add materially to the construction of new school buildings during the ensuing year.

Essentials of Taxation and School Support

THIS publication has consistently and persistently for a period of two decades championed the cause of equitable and adequate taxation in order that the nation's system of popular education might receive the support. It urged upon the educators who concerned themselves with administrative phases in support of the country's school system to go one step further and concern themselves also with the sources of that support.

It took many years to induce the American schoolmaster to turn to the subject of taxation. We have always confidently believed that once he made a study of the subject, estimate its importance and its application to the cause of education, he would rise to a new power and service.

The past few years have noted a growing interest in the subject of taxation. Eminent educators have come forward not only with a manifest concern in the subject but with a splendid mastery of all that is implied in an efficient system of taxation. State school officials, college professors, and state educational associations have given voice not only to the needs of the schools but also to the manner and means of securing adequate support for them.

A most instructive document on the subject has just been issued by the National Education Association under the title of *Essentials of Taxation*. While it is held within somewhat compact lines, the document is sufficiently comprehensive and lucid in all the phases that logically come within the scope of this all-important subject. The authors, Professors Harley L. Lutz and William G. Carr, not only explain the nature and purpose of taxation but also point out what makes for both equity and adequacy in a tax system. They also initiate the student into the realms of the property, income, and sales tax, and explain what constitutes an efficient administration of these several systems.

It is indeed gratifying to note that the leading educators of the nation have awakened to engage in a task which is clearly theirs and to manifest a grasp of an involved and complicated subject but one which is of prime importance if the cause of popular education is to be served.

The National Education Association has behind it a constituency which may become a powerful factor in bringing about reforms in the country's system of taxation. The intelligence which radiates out

of that constituency may do much to educate the masses as a whole and create that public sentiment without which no great reform can succeed.

Secretarial Service in School Administration

AT A time when the expenditure of a dollar comes under closer scrutiny the function of the secretarial service of a school system becomes increasingly important. The official who usually holds himself in a modest background in the capacity of a secretary, aiding in projecting board members, superintendents, and principals into the limelight of public attention, nevertheless may at times hold the key position.

It is at the point where the dollar comes in and goes out that policies and departures may pivot about one man and where the wisdom or fallacy of a project must find its decision. The official who deals at close range with the financial operations of a school system is in possession of knowledge that inspires steadiness and stability to school-administrative deliberation.

The National Association of Public-School Business Officials has made a notable contribution to the business efficiency of school administration. It has brought to the surface the experiments and experiences of school systems in the several phases of business management and thus enabled a process of sifting and improvement.

The Association of School Boards of New York has rendered a distinctive service in the promotion of business efficiency in the field of school administration. Similar organizations in Pennsylvania, California, Ohio, Montana, South Dakota, Illinois, and Wisconsin have likewise worked in the direction of administrative efficiency. Their deliberations have been highly illuminating and instructive.

In some states, notably Pennsylvania and California, the public-school secretaries come together for an exchange of views and discussions on experiment and experience. These have their distinctive value. In the State of Iowa a conference of public-school secretaries and business managers was recently staged. There were discussions on such subjects as The Need of Tax Revisions, Emergency Financing, The Budget in Relation to Shrinkage in Tax Collections, Survey of Comparative School Costs, Budgets on the Basis of Average School Attendance, Cheaper Fuels and More Efficient Combustion, Implications of Uniformity in Financial Accounting for Schools, Self-Insurance for Public-School Properties, Publication of the Secretaries Annual Report, etc.

These come-together conferences deserve special encouragement at a time when those identified with financial and administrative problems of school government are called upon to manifest a wise economy and at the same time a high order of efficiency.

Public-Schoolhouse-Construction Departments

A NUMBER of the larger cities maintain a fully equipped department which plans and directs the construction of new school buildings, and looks after the repairs of the old buildings. Such departments employ their own architects, engineers, and superintendents, and constitute a complete organization for the performance of the task assigned to them.

While the system which has been in use for some years has been developed into an accepted and reasonably fixed institution, the wisdom of its continuation is here and there being questioned. The former system, whereby architectural and engineering service is obtained upon a competitive basis, is naturally eliminated in cities where the school authorities maintain their own building departments. The independent architect who once specialized in school architecture is no longer employed.

With a decrease in the volume of schoolhouse construction the question arises whether ordinary expediency and economy still warrant the maintenance of an organization at public expense. Here the approach to the subject must, after all, be based upon a normal rather than an abnormal situation, or rather upon a permanent rather than a passing situation. The considerations worthy of note here are that the competitive phase in the field of school architecture has evolved the specialist. This has led to results which render American school architecture an outstanding if not a remarkable achievement. No other country in the world can boast of school structures equally practical and equally stately. The specialist has gone intimately into the functional operations of the school as such and constructed the housing in order to facilitate such operations. The school is no longer fitted into the building, but the building is made to serve the school, in order that it may realize in the highest degree the purposes for which it exists.

The question, in this instance, resolves itself into one of economy and efficiency in the conduct of a public-school-building department, as against the so-called open and competitive architectural system. Representatives of the American Institute of Architects hold that the charge of 6 per cent for new work and 10 per cent for remodeling jobs is less than is the cost of maintaining a public-school-building department, whose overhead is the same the year round whether the construction operations are light or heavy.

While this statement sounds plausible, it still remains necessary to determine the relative merits of the two systems. The public-school-construction department, as exemplified in the larger cities of the United States, is the outcome of an evolution in which expediency and economy were the controlling factors. Once established, and having demonstrated its utility, it will be difficult to abolish it. Architects who attack the innovation upon the sole argument that public agencies ought not to interfere with private enterprise, will have to go several steps farther and bring to the surface the ultimate economies involved in the problem before final judgment can be rendered.

Ethics for Boards of Education

IT MUST be taken for granted that public bodies deliberating upon measures and departures which concern the welfare of the community are guided by sincerity and honor. The public exacts honesty and efficiency. It cannot always discern motives or control action. A crossfire of arguments must bring the truth to the top and thus prompt wise conclusions.

Among public bodies, the modern board of education is expected to set the pace not only in an intelligent approach to the problems in hand, but in the observance of ethical standards as well. Its ministrations contemplate a high mission, fostering the complete welfare of a rising generation, and involving the progress, stability, and perpetuity of a great nation.

In a recent discussion on the ethical side of school-administrative deliberation, Mrs. Elizabeth M. Mehan, a member of a board of education, said:

"Some of the unethical practices in which boards and their members engage are probably due to a lack of understanding of the proper course to be pursued while in others it represents a case of yielding to the temptation to place the welfare of some politically minded individual or group ahead of that of the children and their parents. Very often the party concerned is the board member himself. He hopes to benefit either directly or indirectly from some bit of favoritism shown, even though his gain is the children's loss. It very often happens that a newly elected board member feels that he has a special mission to perform as the chosen representative of some particular group or interest which was instrumental in securing his election or appointment. If chosen from a ward, he is likely to feel that his first obligation is to his ward supporters rather than to the children of the entire school system. It may be that certain interests in a section are demanding the erection of a new school or the purchase of a certain site in order that friendly real-estate promoters may be relieved of some of their burdens. Any member of a board who caters to those who have special interests, instead of placing the interests of all the children of the entire school system first has no business on an American school board. His field is politics and not educational service to children."

The thought that must be borne in mind here is that the citizen who accepts a board-of-education membership does so in a spirit of patriotic service, unselfishly rendered. Again, he must become familiar with a school system before he can deliberate over its destinies with a degree of intelligence and finality. This means that the new member must be circumspect and observant before he ventures upon opinions or recommendations. Ethical standards must control every conclusion and action.

To the Members *of the* Department *of* Superintendence: Open Letter *Number Nine*

HOW WOULD YOU ANSWER THESE QUESTIONS?

The paramount question confronting boards of education and executives is the financing of the public schools. This question has two phases: the methods used to raise the money, and the way in which the money raised should be spent. Both are of equal importance and must be considered together.

Dr. Ballou's committee on "Financing Public Education," as was indicated in the December Open Letter, will consider various plans for providing an adequate and equable system of taxation.

The other committees will discuss the scope of the work for which the money raised is to be spent. They will attempt to answer many questions. Recently Superintendent Lake, of Cleveland, placed before his principals several important questions. I am including here some of his questions and some other questions prepared by the Committee Chairmen. This is done for three reasons: First, the members of the Department may find them an interesting and valuable device, as I did, for stimulating interest among their principals by using them at a principals' or teachers' meeting. Second, they indicate the wide scope of the field of education we will cover during our convention week. Third, they indicate how interdependent and interrelated is the whole problem of financing our public schools.

Questions

1. What, if any, limitation of the supply of new teachers should be established, by whom and how?
2. What coördination of teacher-training programs should be established in states and in the nation?
3. What should be the course of study for prospective teachers?
4. What are education's objectives in a planned society?
5. What is an adequate program of adult education for the New America?
6. What is society's obligation to youth in the New America?
7. What should be the objectives, scope, and delimiting principles of a satisfactory educational program for children under six years of age — the preschool and kindergarten group?
8. What should be the objectives, scope, and delimiting principles of a satisfactory educational program for elementary-school pupils — the preadolescent group?
9. What should be the aims, function, and range of a satisfactory program of special education for atypical children?
10. What should be the objectives, scope, and delimiting principles of a satisfactory educational program for junior- and senior-high-school pupils — the adolescent group?
11. What should be the objectives, scope and delimiting principles of a satisfactory educational program for students of junior-college and college levels; and to what extent should the public assume responsibility for the support of higher education?
12. What are the functions of the public school as a center of social services to the community, and what principles should be established delimiting the scope of such services?
13. What are the possibilities of constructing a suitable combination of vocational and cultural courses for a satisfactory program of vocational education in a comprehensive program of public education?
14. How can a school system with limited funds at its command develop an adequate program of guidance?
15. What are the economic and social forces that are bringing universal education to youth up to the age of 18 or 20 years, and what readjustments of our curriculum and educational program will be necessary to meet the needs of all youth in such a program of universal education?
16. What are the schools doing to lift and maintain the American standard of living?
17. What have the public schools done to act as a stabilizing influence in this depression?
18. What are the schools contributing to the health of the people?
19. What has been the contribution of public education to good citizenship and character?
20. What is the contribution of the schools to vocational efficiency?
21. What are the schools contributing to the control and reduction of crime?
22. Just what subjects are valuable today? If financial resources are further curtailed, are there subjects that can be eliminated? (Lake)
23. Can money be saved by curriculum changes which do reduce services to pupils, but do not result in the elimination of pupils from school? (Lake)
24. Can we further curtail administrative and supervisory services and maintain an efficient school system? (Lake)
25. Shall we operate schools so that we may keep the salaries of teachers as high as possible, or employ a larger number of teachers even if salaries must be reduced to do so? (Lake)
26. Shall we eliminate special activities, such as school newspapers, bands, orchestras, school clubs, interscholastic athletics, to reduce costs? (Lake)
27. What system of financing public education shall we advocate? Some system of state support must be devised to make it impossible for education to vary with the political whims and the economic differences in communities. (Lake)
28. What principles govern a program of public relations?
29. What should be a five-year plan for the work of the Department of Superintendence?
30. What policies should govern the relation of the Federal Government to the financial support of education in the states?
31. What are the agencies, organizations, and forces which consciously or unconsciously exercise influence upon the curriculum of American public schools on a nation-wide basis?

The Committee on Resolutions, of which Superintendent E. E. Oberholtzer, Houston, is chairman, is ready to receive your suggestions for resolutions. If you have any resolutions you wish considered, please send them directly to him.

Faithfully yours,

PAUL C. STETSON

President, Department of Superintendence

P.S. The questions followed by "Lake" are those placed before his principals by Mr. Lake.

December 2, 1933.

Modern Design *for* School Buildings

Alexander C. Guth, A. I. A., Milwaukee, Wisconsin

It seems but a sign of the times that conservative bodies like city boards of education should give some thought to the modernistic style of architecture for their school buildings. When this subject is carefully analyzed, it will be found that school boards should have no hesitancy in permitting their architects to indulge in these new flights of fancy. To some who still think of the solid, slow, conservative growth of schoolhouse design, this new style may appear somewhat alarming. But the results which have been attained in the few examples extant should go far toward alleviating such feelings. Slowly and gradually this style is bound to supersede the historical ones. In other words, schoolhouse design like that of all other buildings, is undergoing a great and gradual change. Every attempt is being made to inject the modern spirit into all pertaining to architecture. There has been a great turnover in building materials in the past few years, which has had its effect on the design of all buildings. The architect inevitably is stepping into the picture and is using these new materials intelligently. His art cannot fail to keep step with the science of the producer.

This is a transitional period in which we are living, and we must look forward to changes also in its architectural style and taste. Out of the readjustment period and the return to normalcy which we hope is about to take place, a new phase of architecture is sure to emerge. Times are propitious for a change. We have about exhausted ourselves architecturally. Playing the part of the copy-cat has run its course. Classic and renaissance motives must be put into the discard. In other types of structures this change has taken place, why not also in schoolhouse work? It is just as logical in one as in the other.

By its very nature architecture is circumscribed as a medium of expression by utilitarian and technical conditions. This is especially true of school buildings. Architects must cease to rehash the models of the past. Our school buildings must no longer be made to masquerade in borrowed clothing. They must be of a style and type which will be an expression of this time, of this age, of our present social life, and of our present educational program.

As applied to school buildings the modern architectural treatment will require more study and skill on the part of the architect than for most any other type of structure. This primarily because of the great number of openings which are necessary in a school building. To design a wall pierced with so many openings requires much ingenuity. Architects must avoid the danger of making the finished results look like a number of soap boxes set on end.

And what does this new and as yet unnamed phase of architecture represent? What are its elements? Meaningless ornament, belt courses, and cartouches are all eliminated, and in their places we find a reserved type of design. Verticality is emphasized because the modern architecture is a development of the skyscraper and found its first inspiration in this type of structure. Hence, we sometimes hear it called "skyscraper architecture." Again, there seems to be a way of setting back the upper portions of the building to make a more interesting silhouette — another feature of the tall building with its diminishing gird upward. We find the cornice entirely omitted and we don't miss it. Enriched bands of delicately carved ornament have taken its place. Henceforth, beauty must be found in the contour of masses, and decoration must not be permitted to detract from their effectiveness. This economical style must be handled knowingly, otherwise the results will appear amateurish and weak. The economy of motives and the sense of simplicity must not be overdone. And above all, the conventional motives of the historical styles may not be reflected in this new style: it must be carried out consistently as an expression of the true character of the building.

We have been about fed up on school buildings designed in the Elizabethean style. So much so that we almost loathe that beautiful development. This adaptation to the requirements of the times had its limitations. The modern style suggests a desire to make our necessary forms

(Concluded on Page 46)

STANDARD SCHOOL EQUIPMENT

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—Harold H. Werner

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(Concluded from Page 44)

more beautiful and to have more regard for the strict utilities and finally to be a frank expression of the times.

Schoolhouse architecture cannot lag, but must keep pace with other structures. It has done so in planning and in instructional and service appointments. America has glorified the school. We have poured boundless wealth into school buildings in order that they might arrive at the highest point of achievement and perfection. All great developments in industrial and applied science have had a marked influence on the development of American education. And the progress of education has been found fundamental to the progress that has been made in school architecture. Most school boards have been alive to the entire situation and likewise equal to it. And since they understand it, they will approach this new phase of its development with an open mind.

Now that this insurgent movement in architecture has taken a foothold, what are school boards going to do? It is believed that for the most part they will be as tactful as they have been in the past and leave it to the architect to work out — to develop. And so the architect's task of the future will be a more difficult one with relation to the design of school buildings. He will cast away traditions and begin all over again. His stupidity or his cleverness are in the balance. We are on the threshold of a new architectural era — not a renaissance this time, but a real logical and beautiful achievement which will take its place beside the flower of the other period — the Classic, the Gothic, and the Renaissance.

NEW BOOKS

Skyscraper

By Elsa Naumburg, Clara Lambert, Lucy S. Mitchell. Cloth, quarto, 80 pages. Price, $2. John Day Co., New York, N. Y.

The story of the building of a great American skyscraper is here told for children, but the book will interest adults more than the youngsters. In form, text, illustrations, the book is quite as modern, quite as powerful, quite as attractive as the Empire State Building whose erection it chiefly records, but whose name it mentions only accidentally. As a photographic presentation of present-day industrial processes and engineering triumphs, the book deserves study by vocational guidance groups quite as well as by social-science classes.

Fact and Story Readers

First Steps. Paper, 40 pages. American Book Company, Chicago, Ill.

This "first step" in pictures and text tells a story all children will understand and love. The complex and difficult job of translating marks into meanings and sounds should be relatively easy because of the clear manner in which the pictures tell the story and contain a complete clue to the meaning of the text on each page. The book has a vocabulary of 68 word forms and a total of less than 900 running words. In every respect it is an ideal pre-primer.

Scientific Science Stories

Book I. By W. L. Beauchamp, Gertrude Crampton, and W. S. Gray. Cloth, 144 pages. Price, 60 cents, list. Scott, Foresman & Company, Chicago, Ill.

It has required many years of development to destroy the notion that reading should be taught merely for the purpose of reading. The mechanics of the subject are still insisted upon in the first four grades and the development of a well-rounded body of information in other fields, and the acquisition of skills and attitudes in these fields is subordinated to an astonishing degree. The loss due to the lack of a carefully developed program which utilizes all reading as the vehicle of instruction in the social sciences, science, and mathematics, from the very beginning of the first grade, is only slowly becoming understood.

The present book is an outstanding example of a carefully planned and coördinated program of vitalizing reading for "life service." It is a most attractive science book that offers at once directly valuable reading lessons in which truthful and accurate science information is the means of teaching a useful vocabulary, and of interesting children in observing nature and the simplest scientific facts quite as much as developing silent reading skills. A few scientific experiments that can be understood by 6-year-olds, as well as field trips, are suggested by the text. There are 485 words in the vocabulary of the book, at least a third of which have been met in any standard first reader; the rest are quite within the ability of the children and are of permanent value. The illustrations in full color are remarkably accurate in detail and color, but distinctly childlike in interest.

The Book of Modern Letters

By Sarah Taintor and Kate Monro. Cloth, 367 pages. Price, 60 cents. The Macmillan Company, New York, N. Y.

The compilers of this book quite successfully prove their contention that modern letters are no less charming and full of subtle literary values than those of the eighteenth and early nineteenth centuries; all that is required is the patient persistence to find in the vast flood of available materials the most interesting, significant, typical, and useful examples. Modern men and women have at their command vast new funds of science, invention, discovery, travel, affairs of state, stirring events, and delightful personal experiences. These may form the subject matter of letters graceful and skillful in expression, deeply human and revealing in personality, dignified and restrained in sorrow or misfortune, happy in humor, and glowing in achievement. If any criticism were to be offered, it would arise out of the fact that the examples do not include any with a deeply religious sense. In fact one or two examples are quite the opposite, or at least scientifically cynical. The letters of greeting, thanks, congratulation, and apology are more than typical — they are distinctly helpful.

Administration of Mathematics in Secondary Schools

By E. R. Breslich. Cloth, 415 pages. Price, $3. University of Chicago Press, Chicago, Ill.

The problems belonging to the head of a department of mathematics in directing the teaching activities and improving their efficiency through supervision constitute the major part of this book. Intimately related to these problems is the development of the curriculum and an important chapter is naturally devoted to this fundamentally important activity. The author places a high value upon a general program of supervision, backed by a comprehensive scheme of testing, and constant use of individual instruction, to make up for differences in ability and interest. Special chapters take up the selection of general materials and the organization of instructional materials in algebra and geometry. The correlation of mathematical subjects within the secondary school, and the articulation of junior and senior high schools, are among the broader problems

(Concluded on Page 48)

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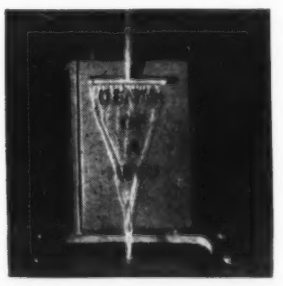

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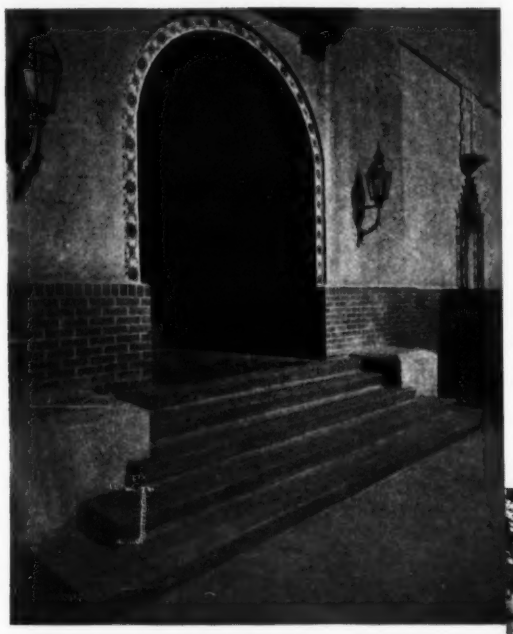

Science Building, State Teachers College, San Jose, Calif.

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(Concluded from Page 46)

which the supervisor must solve. A final chapter takes up the unification of all mathematics curricula and suggests the need of integration not only within the department and the secondary school as such, but also their reconstruction in connection with schools of higher and lower levels, and finally their application to the changing social and economic conditions. The superintendent and the principal who desire to be of a genuine help to the high-school mathematics department will find this work the most helpful at present available.

The author is rather modest in not putting forth his ideas as the last word; he rather allows the statement of problems and conditions to suggest a careful consideration of local conditions and the personal solution of difficulties.

First Day with Numbers

By C. B. Upton. Cloth, 160 pages. Price, 40 cents. The American Book Company, Chicago, Ill.

This arithmetic for the first and second grades is, in reality, a reader which introduces children to the facts of number by means of stories, play, classroom activities, and clever reviews and tests. The book has a total vocabulary of slightly less than 500 words and does not contain any words, with the exception of eight or ten arithmetical terms, which are not already familiar to first and second graders. The approach is so natural that it is hardly realized that there is a carefully studied method and that the work contains nothing which must later be undone. Each fact is carefully developed, represented in a series of thorough drills, reviewed, and finally clinched by means of a test and suggested remedial lessons. The book can be recommended without reserve.

How the World Lives and Works

By Albert P. Brigham and Charles T. McFarlane. Cloth, octavo, 406 pages, illustrated. American Book Company, New York City.

The new series of geography textbooks, *Our World and Ourselves,* of which this the fourth (seventh-grade) book is decidedly modern in the best sense of the word. The first book presents the fundamental notions of geography in concrete story form, the second presents the home state and continent for its own importance and as a background for comparison of types, the third extends this treatment to the world. This fourth book considers world geography in fourteen units based on the world in space, the art of map and graph making, weather and climate, products, occupations, transportation, etc. The parts of the world are treated in this volume not as political divisions but as types grouped under headings such as we have listed.

For the pupil who completes this course geography will not be just a conglomeration of maps and place names, but rather a visualization of causes and effects.

Educational Psychology

By William A. Kelly. Cloth, 521 pages. Price, $2.40. The Bruce Publishing Company, Milwaukee, Wis.

This book approaches the problems and principles of educational psychology from the standpoint of the Christian educator who is concerned with the development of personality in the light of the postulates, principles, and ideals of Christian faith.

The book is an inclusive presentation of the principles of psychology as applied to education, and chapters on the learning process, the growth and development of children, discipline, character formation, and transfer of training are included. The recent development in the field of statistical methods, the measurement of intelligence and educational achievement, tests and testing are included.

The author has an extremely practical, commonsense approach to the subject, and while he is not unmindful of the latest research and the newest theory, he is conservative in his application of new ideas and principles. An appendix contains a complete series of objective tests in educational psychology, together with suggestions for collateral work that will round out a practical year's course.

The Disposition of School-Bond Issues and Special Levies in Ohio Cities and Exempted Villages, at the November, 1933, election. Compiled by T. C. Holy, and published by the Bureau of Educational Research, Ohio State University, Columbus. Of the 109 cities reporting in the study, only 3 submitted bond issues at the November election. Only 1 of the 3 bond issues was carried at the election, while 2 failed. The total amount of the bond issues which carried was $35,000. In the case of the exempted villages, reports were received from 48 to 49 villages, and only 2 of this number submitted bond issues at the election. The number of bond issues carried was 2 and the total amount of the bond issues carried was $172,500.

Compensation for Injured School Employees. Published by the Research Division of the National Education Association, Washington, D. C. This timely study discusses the extent of present compensation insurance as it applies to school employees. Fifty cases arising out of accidents are summarized.

A Uniform Financial Procedure for General Fund Expenditures in Oklahoma Schools. Prepared under the direction of Marshall Gregory, director of the division of research and service of the Oklahoma State Education Department. The bulletin seeks to present a good legal procedure for accounting for general-fund expenditures, to furnish information on school costs, to simplify the making of the budget and the annual financial report, to afford records which will protect school clerks and superintendents against charges of graft and poor management, and to assist treasurers and school clerks in classifying school expenditures. The booklet is divided into five sections, dealing with the administration of school expenditures, the preparation of the budget, purchasing and paying for school services and materials, accounting, and classification of expenditures. The last part of the booklet is devoted to four appendices on school insurance, calculation of per capita cost, and other valuable information.

Financial Data for Ohio Cities and Exempted Villages for September, 1933. Compiled by T. C. Holy. Issued by the Bureau of Educational Research, Ohio State University, Columbus, Ohio. The report showed that 3 districts submitted bond issues, and that the total amount of the bond issues submitted was $2,535,000. The number of districts submitting special levies was 10, of which 9 were renewals. The number of districts issuing refunding bonds was 33, and the total amount of refunding bonds was $2,301,619. In the case of the exempted villages, the total number of districts submitting bond issues was 2, and the total amount of the bond issues submitted was $172,500. The number of districts with refunding bonds was 9, and the total amount of refunding bonds was $140,000. Schooi bonds amounting to $3,322,840 were submitted at the November election in all school districts. Of this amount, all but $7,000 came under the provisions of the NRA.

District Organization and Secondary Education. Prepared by Fred Engelhardt, W. H. Zegel, Jr., W. M. Proctor, and S. S. Mayo. Paper, 208 pages. Price, 15 cents. Bulletin No. 17, Monograph No. 8, 1932, of the United States Office of Education, Washington, D. C. This report, undertaken by a committee in charge of Dr. Leonard V. Koos, deals with one of the major topics of the Survey of Secondary Education; namely, the district organization. The study is divided into three parts, comprising district organization in the United States, school and district organization in California, and school district organization in Illinois. The surveyors take up specifically the availability of secondary education within the districts, special provisions for secondary education, plans for the reorganization of districts, superintendency areas in counties, changes in state policies and school laws, and legal background and growth of township and community high schools. The report concludes with the statement that "it would seem that the only method that will provide a state with a desirable local-district unit is one that will result from complete reorganization. A sound foundation must be constructed upon which a complete minimum program of education can be operated and developed."

Safety in Physical Education in Secondary Schools. By Frank S. Lloyd. Paper, 167 pages. Price, $1.25. Published by the National Bureau of Casualty and Surety Underwriters, 1 Park Ave., New York, N. Y. This is an analysis of accident cases in physical education in high schools and preparatory schools. It represents a total study of accidents in 510 secondary schools, representing a student population of more than 600,000. During the year 1931–32, a total of 17,329 accidents were reported, resulting in 70,767 days lost. Nearly 20 per cent of the accidents and 10 per cent of the days lost were attributable to equipment hazards. The book suggests a specific program for improving the conditions.

Cumulative Pupil Personnel Records, Bulletin 81. Department of Public Instruction, Harrisburg, Pa. A complete cumulative system of records for pupils and teachers, includes registration form, curriculum record, pupil self-analysis form, transfer card, test and measurement records, teachers' estimate form, teachers' personnel records.

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PERSONAL NEWS

● DR. WILLIAM O. THOMPSON, president emeritus of Ohio State University, died in a Columbus hospital on December 9, following a week's illness from a heart attack. Dr. Thompson, who was a native of Ohio, had a long career as an educator, and served successively as president of Miami and Ohio State universities.

● MR. FRANK V. POWELL, superintendent of schools at Platteville, Wis., has resigned in order to accept the position of state high-school inspector.

● SUPT. C. J. THOMSON, of Brown City, Mich., was honored at a banquet because of his ten-year record of agricultural work in the high school. He was presented with a golden key by the agricultural division of the National Vocational Teachers' Association.

● SUPT. W. A. WALLS, of Kent, Ohio, is this year completing 22 years of service in the city, 8 years from 1907 to 1915, and is now completing 14 consecutive years as superintendent since 1920.

● DR. J. M. GWINN, who recently resigned as superintendent of schools at San Francisco, Calif., has been appointed to a new position of educational supervisor to the board. Dr. Gwinn was appointed to the position at the time Dr. Lee was named superintendent.

● MR. R. M. STANTON has been reëlected as president of the board of education at Oil City, Pa.

● DANIEL B. WOOLCOCK has been reëlected to the presidency of the school board of New Castle, Pa.

● The school board of Erie, Pa., has reorganized for the year, with the election of JOHN MACDONALD as president, and WILLIAM MCCLELLAND as vice-president.

● ANTHONY J. FOSTER MECK has been reëlected as president of the board of education of Altoona, Pa.

● MR. J. F. WADDELL, of Evansville, Wis., has been appointed assistant state superintendent of public instruction, to succeed O. H. Plenzke. Mr. Waddell is a graduate of Whitewater College and the University of Wisconsin, and for the past five years has served as state supervisor of high schools in the state.

● MR. R. H. LATHAM has been elected superintendent of schools at Asheville, N. C., to succeed W. L. Brooker.

● L. A. MAHONEY, superintendent of schools of Moline, Ill., from 1915 to 1931, died at the home of his son in Moline, on December 2. He was 58 years old. Mr. Mahoney resigned from active work in 1931, to serve in an advisory capacity as assistant superintendent, but retired in June of this year because of failing health.

● STATE SUPT. L. A. WOODS, of Texas, recently ruled that M. R. Nelson is duly elected superintendent of schools at San Felipe. The ruling was given as a result of the rival claims of Dr. C. E. Castaneda and Mr. Nelson to the superintendency.

● COL. HENRY B. ROSE, former secretary of the school board of Providence, R. I., was guest of honor at a dinner given on December 6. The dinner was arranged by Supt. A. J. Stoddard and was attended by friends, former associates, and citizens who had known Mr. Rose during his service as school secretary. Among the guest speakers were Isaac O. Winslow, superintendent emeritus; Miss Ethel Mathewson, clerk to Mr. Rose; William F. Redding, successor to Mr. Rose; and F. J. Brady, chairman of the school board.

● WILL A. GRAY, formerly assistant clerk of the board of education at Worcester, Mass., recently took the civil service promotional examination for the position of business manager, to succeed Joseph Beals, who retires on January 12. Mr. Gray entered the school department as a clerk in June, 1895, and was made assistant clerk of the board ten years ago. The position carries a salary of $5,100.

DR. EDWIN A. LEE

Superintendent of Schools,

San Francisco, California

Dr. Edwin A. Lee, who has been elected superintendent of schools at San Francisco, Calif., was formerly professor of education and director of vocational education at the University of California.

Dr. Lee, who was born at Redding, Calif., was educated in the schools of his native town. He is a graduate of the Chico Normal School and Columbia University, and holds a Ph.D. degree given by the latter institution in 1926.

Dr. Lee was head of the vocational-education department of Indiana University and for several years was connected with the New York schools. He is the consulting editor of the McGraw-Hill Book Company vocational text series, and a writer of many magazine articles on vocational subjects. He was responsible for the development of teacher-training programs in vocational education in six universities.

● MR. THOMAS A. HUGHES has been elected secretary and business manager of the board of education at Philadelphia, Pa., to succeed Edward Merchant, who has retired after a long period of service. Mr. Hughes, who was formerly assistant secretary, has been associated with the school board for 37 years. MR. ALBERT L. HAAS was named assistant secretary, to succeed Mr. Hughes.

● MR. F. W. BOWERS, MR. I. R. MARSH, and MR. G. S. GETZ have been reëlected as members of the school board of Kent, Ohio. Mr. Bowers has served continuously on the board since 1902, a total of 31 years, and has served 19 years as clerk.

● MR. GEORGE F. AVIS, president of the board of education of Hudson, Mich., died at his home on November 25.

● CHARLES M. SCHENCK, 83, for many years a member of the school board of Denver, Colo., died suddenly at his home on November 8, following an attack of heart disease. A resident of Denver for 40 years, Mr. Schenck served for 16 years as a member and an official of the board of education. He became a member of the board in 1917 and served successively as treasurer and president, retiring in May, 1933. During his connection with the Denver school board, Mr. Schenck was credited with the reorganization of its administrative policies, with the establishment of the department of curriculum revision, the adoption of an improved salary schedule, and the inauguration of a pay-as-you-go building program.

● MR. WALTER R. HEPNER, of San Diego, Calif., has been appointed chief of the division of secondary education of the state department of education. Mr. Hepner will make his headquarters at Sacramento. In his new position, Mr. Hepner will have as his duties the reorganization of secondary education; the readjustment of methods of instruction; the development of a plan of financing; the devising of improved educational relations in the secondary field; the improvement of teaching and teacher training.

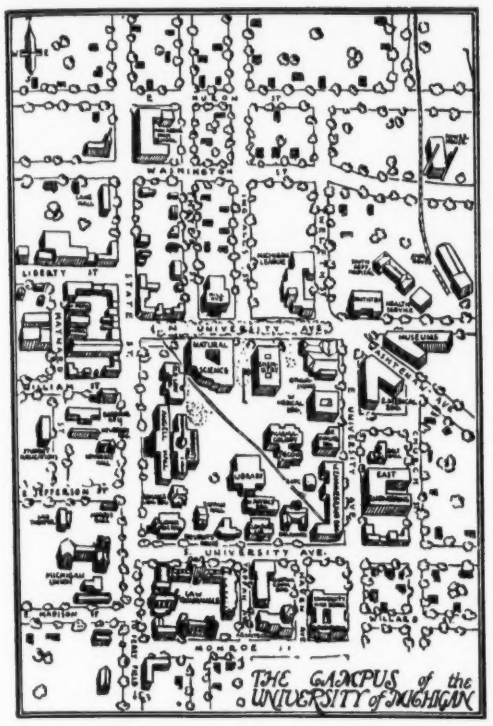
● MR. H. CLAUDE HARDY, formerly associate superintendent of schools at White Plains, N. Y., has been elected superintendent of schools, to succeed John W. Lumbard, who has retired after completing 21 years as head of the school system. Mr. Hardy is a graduate of Wyoming Seminary and Wesleyan University, and has filled a number of administrative positions in New York state. He was principal of the high school at Schenevus, superintendent of schools of Sidney for two years, and superintendent of Fairport schools for five years. In 1925, he became superintendent of schools at Oneida, resigning in 1927 to accept the associate superintendency at White Plains.

● W. E. PHIPPS, superintendent of schools of North Little Rock, Ark., has been appointed State Superintendent of Public Instruction.

● The teachers' club at Kalamazoo, Mich., has financed the purchase of a collection of books for the public library as a memorial to the late E. H. DRAKE, superintendent of schools. A photograph of the late superintendent is displayed with the books.

● MR. W. D. WALDRIP, of Richmond, Ind., has been elected superintendent of schools at Savanna, Ill.

● SUPT. S. B. TOBEY, of Wausau, Wis., has announced his retirement at the end of the current school year. Mr. Tobey has served the Wausau schools for 39 years in the capacity of teacher and superintendent.



37 Buildings on the UNIVERSITY of MICHIGAN Campus are International-Equipped « « «

Self-Regulating Electric Time was installed at the University of Michigan shortly after *International* introduced it in 1924. Since then the school has grown. The time system has grown along with it because accurate, uniform timing is an essential factor for efficient handling of the thousands of students engaged in a wide diversity of academic and special studies.

Throughout thirty-seven of the chief buildings nearly three hundred International secondary wall clocks have been distributed. Supplementing them are time stamps and attendance recorders. Period schedules are maintained in constant agreement with "university time" by means of a series of International program machines.

This entire system is under the constant control of an International Master Clock which not only furnishes correct time to all units but automatically provides twenty-four opportunities for regulation each day. Continuous uniform time is guaranteed without the necessity for manual attention.

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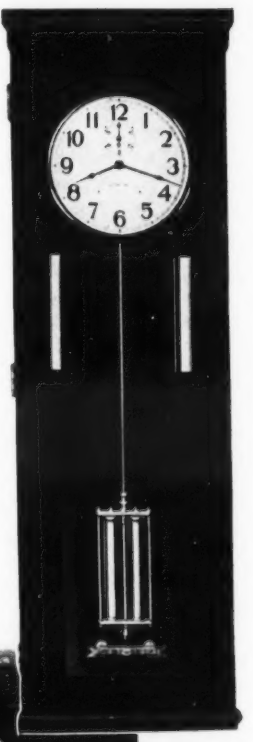

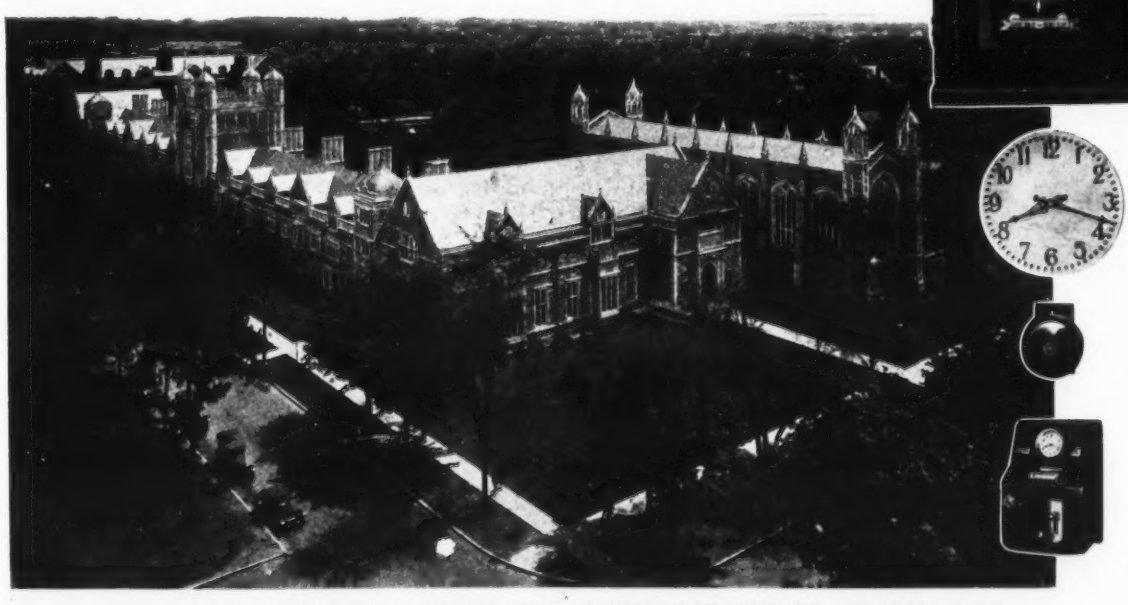

AERIAL VIEW OF THE LAW QUADRANGLE, UNIVERSITY OF MICHIGAN, ANN ARBOR, MICH.

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Two of the Institutions featured editorially in this issue of the School Board Journal are also International equipped. They include: The Madison School at Winona, Minnesota; and the Mariano Guadalupe Vallejo Junior High School at Vallejo, California.

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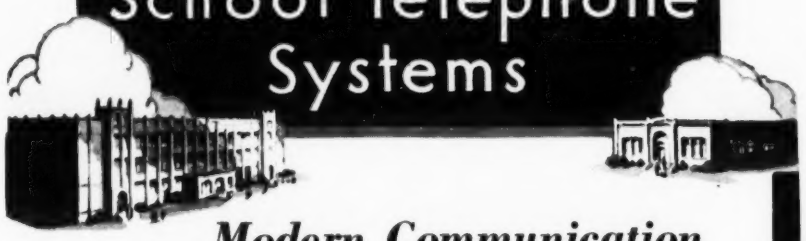

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For the same reasons, an interior telephone system is an essential unit in the equipment of every school. Principals and superintendents find the telephone an indispensable aid to administration — a time saver and step saver for every school employee.

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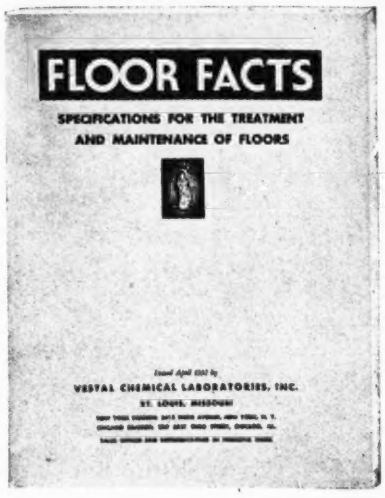
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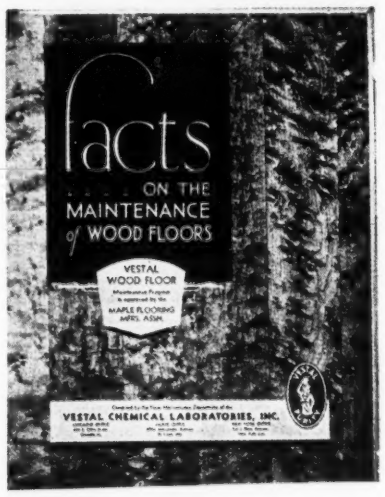

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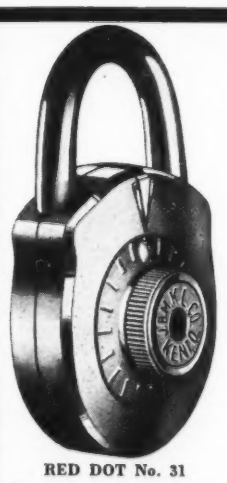

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BUILDING NEWS

♦ Redondo Beach, Calif. The public schools of the city, during the spring and early summer, received considerable assistance from federal relief workers in the grading and leveling of the school grounds, particularly those in sloping land where the grades were too heavy, or where the drainage had cut the surface heavily. These workers also assisted in caring for lawns, shrubbery, flowers, and all types of outside work which the regular employees had not been able to do. The men also worked in cleaning up the refuse gathered as an aftermath of the construction work following the earthquake.

♦ Redondo Beach, Calif. The school buildings of the city were slightly affected by the earthquake which visited the vicinity last March. The board of education took immediate action to remedy the damage to the buildings, which involved the replacement and reinforcement of all parapets on flat-top buildings. The work was completed within two months after the earthquake and was financed with funds in the building-tax department, without the necessity of calling on the citizens for bonds.

♦ Madison, Wis. The school board has approved a program of repairs and improvements to school buildings costing $211,175, under the federal civil-works administration. Of the total cost, $138,090 will be spent for labor, and $69,085 for materials.

♦ Pasadena, Calif. The board of education recently submitted a bond-issue proposal to the voters, in which a request was made for $1,850,000 to be used for strengthening or replacing all school buildings not up to the building-code requirements. There are eighteen reinforced-concrete school buildings which measure up to the new standards imposed by the new state law of last April.

♦ Alameda, Calif. A complete educational and building survey of the public-school system has been started, under the direction of Drs. Hart and Peterson, of the University of California. The board of education has called an election to vote bonds for replacing three elementary schools with new structures. The total cost of the project will reach $605,000.

♦ Claremont, Calif. The school board took advantage of low building costs and the unemployment situation in proceeding to erect an addition for the junior-senior high-school building. The plans for the building were prepared by Messrs. Smith & Powell, architects, of Los Angeles, and the building was completed at a cost of $150,000.

The school board has begun a careful inspection of both the new and old school buildings, under the direction of competent building engineers, in order to determine whether the buildings are earthquakeproof and safe for occupancy.

♦ School-construction work in the State of Delaware, in the amount of $3,210,000, will be conducted under the NRA, according to an announcement of the state board of education. The program includes the proposed Pierre S. duPont High School in Wilmington, to cost $1,800,000. The complete program calls for thirteen school projects, plans for which have been prepared by the architects. The Federal Government has allowed a grant of $300,000 for 30 per cent of the cost of labor and material for the various buildings.

♦ Alva, Okla. The board of education has awarded a contract for explosion insurance on all three of the school buildings. The insurance covers all damages to the buildings, whether total or partial.

♦ Lexington, Ky. The school board has made application to the Federal Government for a loan of from $80,000 to $100,000 to aid in the carrying out of an extensive school-building program. The voters of the city on November 7 approved a bond-issue proposal for $350,000 as part of the plan for financing the building projects.

The program as outlined by the school board, calls for the erection of two elementary schools, additions to a number of elementary schools, and a twenty-room addition to the Henry Clay High School. The architects for the building projects are local firms, with one exception, that of Warner & Mitchell, of Cleveland, Ohio.

♦ Chicago, Ill. The resumption of construction work on five unfinished high-school buildings has been ordered, following the allotment of a federal grant of $1,326,000 to cover 30 per cent of the cost of the work. It is expected that 3,000 men will be given work immediately and an additional 1,000 will be given work in the fabrication of materials needed for the completion of the building program. The buildings, upon completion, will provide 16,000 seats for high-school students which are urgently needed.

♦ Cincinnati, Ohio. The school board has proposed an extensive program of school-construction work, calling for the renovating and repairing of 74 buildings. The construction work will be started following the approval of a federal grant which has been applied for.

♦ Medford, Mass. The school board has suggested that the mayor request that $30,000 of the federal cash under the civil works program be allocated to repairs on schools.

♦ Kansas City, Mo. The city has made application for a grant of $525,400 from the public works fund to aid in the erection of new school buildings and additions to others. The school board has prepared a two-million-dollar public-school building program for operation in the near future.

PROGRESS OF FEDERAL FINANCING OF SCHOOL PROJECTS UNDER PWA

Up to December 18, the State Advisory Boards received applications for 1,498 school-building projects involving a total of $189,105,128. The Federal Government up to this date allowed direct grants amounting to $4,732,025 and loans and grants of $29,780,976. This involved 404 distinct projects. The total cost of school buildings to be erected with Federal aid amounts to $49,089,384. The schools have received 5.75 per cent of the total allotments made for non-Federal projects. The schools are receiving an increasing proportion of the weekly allowances made under PWA.

SCHOOL-BUILDING CONTRACTS

According to Dodge, contracts for 189 educational buildings were let in November, 1933. These cost $2,551,700 and amounted to 344,100 square feet of building area.

In eleven states not included in the Dodge figures twelve projects were reported during November. Of these, contracts were let for three amounting to $62,500, and the plans had been completed for nine estimated at $1,785,525.

SCHOOL-BOND SALES

School-bond sales during the month of November amounted to a total of $7,147,718 for new school-building construction. The largest issues were in New York state, $2,122,000; Utah, $1,093,000; Montana, $864,000; Massachusetts, $613,875; Connecticut, $535,000; Rhode Island, $341,000; Wisconsin, $235,930, and Virginia, $228,300. Short-term and refunding bonds were issued to the total amount of $1,337,152. The largest amounts were issued in Ohio, totaling $457,452. The average interest rate as of December 1 was 5.52 per cent.

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THE NEW HIGH SCHOOL AT ISHPEMING, MICHIGAN

(Continued from Page 33)

individuality, purpose, interest, use, and specialization. The furniture, fixtures, walls, work, flowers, freedom, and fancy have all been harmonized in the hand of the artist, be he architect, pedagog, pupil, or what not, for certainly this is the atmosphere of ambition, culture, sincerity, growth — the new education, the new school.

The Special Rooms

The English and language rooms are good illustrations of special classroom environments in the building. These rooms have been designed on the theory that literature is a fine art, which, like painting and music, profits by a proper setting; that English is not simply a body of facts to be examined and reported on but rather a way of doing. The aim is to provide the facilities and to set up an atmosphere in the English and language rooms that will entice even formal teachers to engage in those phases of the work that will vitalize the subject and make it real to the everyday life of the class. Pupils and teachers will participate in the subject matter under consideration, in such ways as will enlist their interests and make an appeal. Essentially the appeal must be a literary appeal and the fundamentals for library study are likewise fundamentals for the English and language classrooms. Comfort, purpose, and use are first considerations to be sure, but the element of personal appeal is likewise most important, because it has much to do with attitude, and attitude, in turn, forms the motive power for response.

From this point on there are no rules to be laid down. The problem is purely an artist's problem. The educator is in the same position as the student; he can understand and use the environment once it is created for him, but the creating lies in the hands of another profession.

It is desirable that the elements in design be capable of being understood and appreciated by those pupils using the room. Failure to understand will inevitably result in failure to appreciate. For this reason architectural styles that date back to corresponding periods in literary excellence, or important historical developments, are especially appropriate. These have the added value of teaching some important characteristics of certain outstanding architectural developments. Very little defense can be set up for not teaching architectural appreciation in the public schools of today in view of the emphasis given to creative artwork in all grades.

When anything so new and so pertinent as studied environments or what is here dubbed "the architecture of education" is taken up by the schools, it is certain to be misunderstood and abused. It is not a task for the architectural draftsman, but rather a task for the architectural educator; for the architect whose interests and experiences lie in the field of education as much as in that of building materials.

ENGLISH ROOM, ISHPEMING HIGH SCHOOL, ISHPEMING, MICHIGAN

Both of the English rooms are provided with a stage: one is finished in soft pine, stained natural in early colonial detail; the other is finished in Tudor oak, with an Elizabethan touch to the design.

The Latin room has a classic effect and the language room is Spanish in character. The architecture is kept simple to give ample opportunities for the class and the teacher to complete the scheme with hangings, pictures, clippings, characteristic plant growth, and statuary.

The social-science room is provided with a voting booth and balustrade rail, with gates and platform so that a typical courtroom or election procedure can be quickly set up in this room.

The same idea prevails throughout the classrooms of the vocational and science departments. As a matter of fact, these subjects supply the method for the academic subjects. A few years ago the argument advanced for introducing vocational work into our academic high schools was the participation and interest which these subjects injected into high-school work. Today, far better reasons exist for giving these subjects a substantial place in the curriculum, and interest is created in the academic subjects themselves by advanced methods of participation.

No word picture can adequately describe the beauty and usefulness of classrooms in the Ishpeming School. The illustrations will be incomparably more satisfactory than any word picture at the command of the writers.

♦ Elmira, N. Y. The school board has approved its 1934 school budget, calling for the expenditure of $945,109. Of the total amount, $416,000 will be raised by taxation.

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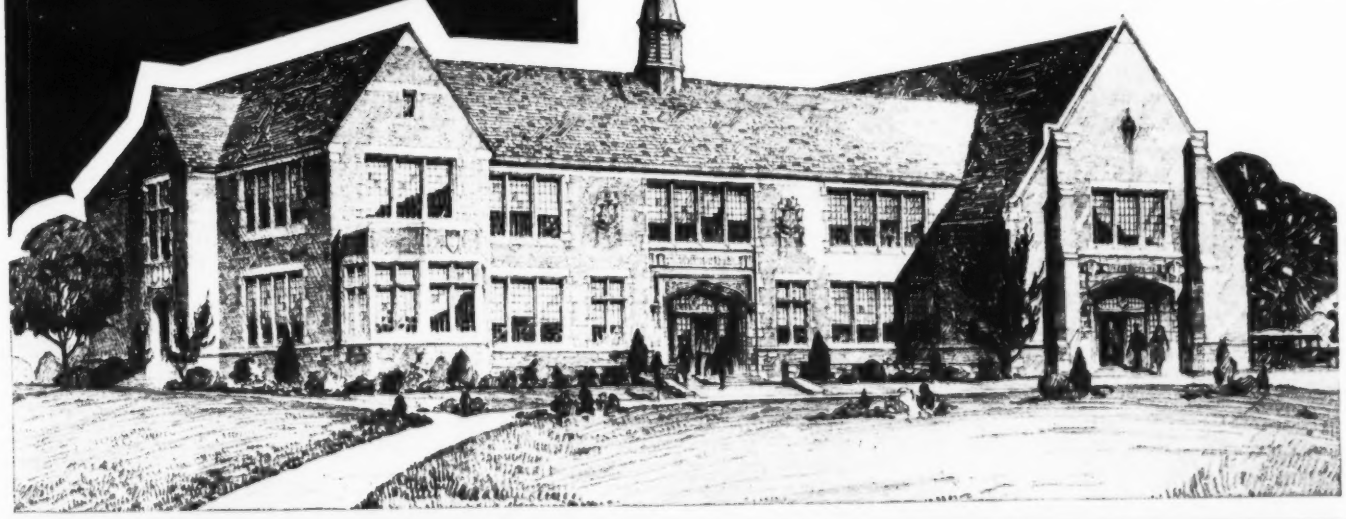

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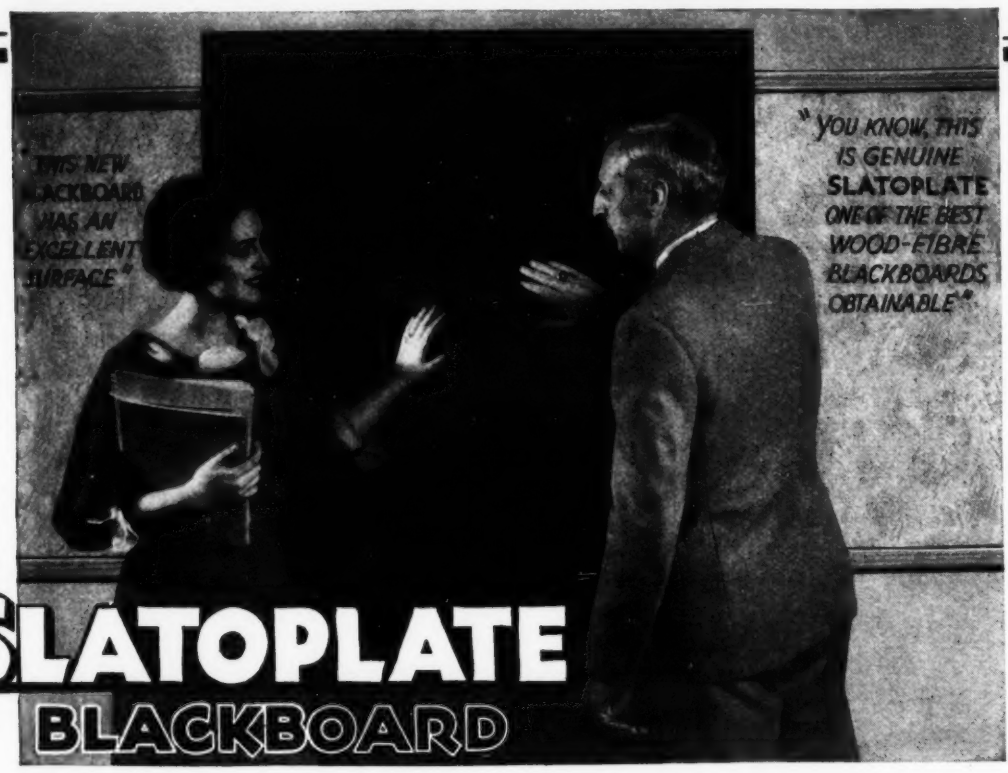
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THE MADISON SCHOOL, WINONA, MINNESOTA

(Concluded from Page 21)

ature control is provided throughout. The 100-horse-power, horizontal, tubular return boiler is fitted with an automatic stoker. A separate water heater supplies the showers and lavatories. Ventilation is obtained by means of a central fan, fitted with an air washer.

The building is equipped with electric lights, clocks, intercommunicating telephones, and an automatic fire alarm and sound horns in all the corridors.

The plumbing equipment includes wall-hung toilet fixtures, and vitreous china urinals and wash basins. In each corridor, drinking fountains of the newest type are recessed in tile arches.

The building has a total cubic capacity of 680,000 cu. ft., a floor area of 30,000 sq. ft., and a corridor-floor area of 6,400 sq. ft. The total cost was $176,000.

The architects were Messrs. Boyum, Schubert and Sorenson, of Winona. Supt. D. F. Dickerson developed the educational program for the building and worked out the entire details for the educational service.

TIME REQUIRED FOR ARCHITECTURAL DEVELOPMENT OF SCHOOL-BUILDING PLANS AND FOR CONSTRUCTION OF THE BUILDING

(Concluded from Page 16)

spects the architect's judgments about time requirements and does not permit "time requirements" to interfere with efficient service.

The architect himself may not insist on adequate time for the performance of services and frequently is forced to the use of "time limitations" as an excuse for inadequate work. Better appreciation of the problems of all parties involved in the planning would do away with any undesirable practices in setting unnecessarily restrictive time limitations.

TABLE V. Time Elapsed Between the Date of Approval of Final Working Drawings and the Date of Award of Building Contracts on 80 School Buildings — Elementary, Junior High, and Senior High Combined
Distributed According to the Cost of the Building

Cost of Buildings	*1 Month or Less*	*1 to 2 Months*	*2 to 3 Months*	*3 to 4 Months*	*4 to 5 Months*	*5 to 6 Months*	*6 Months or More*	*No Data Available*
$100,000 or Less	15	9	2	2			1	2
$100,001 to $300,000	15	7	2				1	2
$300,001 or More	6	11	2				1	2

School executives desiring the opening of a new school building at the beginning of a school year should initiate building plans sufficiently far in advance so that adequate time allotments may be made for each step. The months required by architects on past building projects may be used as guides in determining the full period required for planning and developing buildings of varying costs. The facts are recorded in Tables I, II, III, IV, and V.

SPECIAL ROOMS FOR NEW CHICAGO ELEMENTARY-SCHOOL BUILDINGS

(Concluded from Page 34)

largely of the self-directed and free-learning type. The organization of the school contemplates participation by all of the pupils in an activity program, much of which is to be accomplished through small informal groups or committees. Thus it can be seen that this library is a vital part of the school.

THE HIGH-SCHOOL CLASSROOM

(Concluded from Page 38)

the desks are usually the arm-chair type. Fifty-four per cent of the rooms have nonadjustable desks. The teacher-desk is provided in every classroom. The typical size is 48 by 30 inches.

Summary. The typical high-school building is of Type B construction and has 38 academic classrooms located on three floors. The representative classroom of this group is 28 feet long, 21 feet wide, and 12 feet high; provides 16.7 square feet for each of 35 pupils; 200 cubic feet of air space is provided. The room has fireproof floor covered with hard wood or battleship linoleum, automatic heat control, and steam heat; walls are plaster, tinted a light color, and decorated with four pictures. The room has one door, unilateral lighting, with a ratio of glass to floor area of 1 to 5. There are two electric light outlets. There is 176 square feet of slate blackboard. The room has immovable, nonadjustable, individual desks; electric-bell signal system; a bulletin board 3½ by 5 feet; an electric clock; built-in bookcase, and telephone.

WASHINGTON JUNIOR HIGH SCHOOL, MOUNT VERNON, NEW YORK

(Continued from Page 25)

dead wall panel at the head of the room. The general average in classrooms of 20 per cent exterior glass area to floor area, was increased by not less than 15 per cent, effecting a saving in artificial lighting as well as the eyes of the pupils in the remote section of the classrooms. This idea has been generally incorporated since that time in all school buildings in Mount Vernon, including the Washington Junior High School. Correct orientation has been attained in the disposition of the various wings — the administration and central classroom unit to the east or west, the general-science wing to the south, the art rooms and library to the north, and the auditorium to the northwest to southeast. Ample light has also been maintained throughout the new triangular court in orient-

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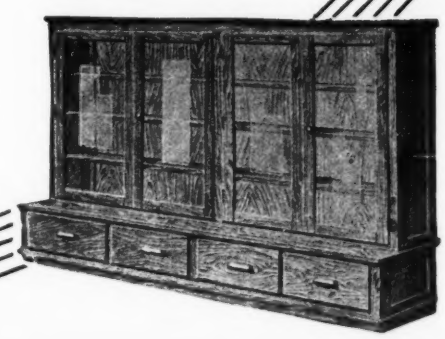

KIMBALL BUILT LABORATORY AND VOCATIONAL FURNITURE CHICAGO

ing it to the southeast. The liberal fenestration of walls provided abundant light throughout the corridors. In the business-methods rooms, reference and art rooms, ceiling ventilighters are employed as an auxiliary source of light.

An innovation in the planning of the classrooms is an angular entry, facilitating circulation as well as supervision. An additional storage closet at the outer wall balances this entry. This is a pleasing modification of the customary stiff rectangular shape of the ordinary classroom.

The use of the split system of heating and ventilating units in the classrooms, with tile walls in the wardrobes and a sanitary floor treatment throughout and abundant light and air, are all factors tending to raise the health standard of the pupils.

Exterior materials are brick, limestone, and terra cotta. The interior materials used for walls subjected to severe use, such as gymnasium, corridors, staircases, locker rooms, toilets, storage and accessories, is a mottled glazed block terra-cotta tile. The use of this decorative structural tile has effected a considerable saving in construction costs and it has also reduced the cubage. This tile is carried through to the ceilings. One interesting exception is to be noted in the main auditorium staircase wainscots which are in marble terrazzo with aluminum alloy strips. The trim in the corridors and for the wearing surfaces in the class and other rooms also is of aluminum alloy. For cabinets, bookcases, and minor furniture items, a hard, white, selected oak has been installed. Floors in lobbies, corridors, stairs, and toilets are of marble terrazzo, with aluminum alloy strips. Exterior doors and interior doors to the auditorium with its accessories, are also in aluminum alloy.

The general construction of the building is fireproof Class A, with an independent steel frame. In the selection of materials a primary factor considered was durability with minimum upkeep in this building to the economy of construction and the need for prudent planning for administration and maintenance. Still, an expression of beauty has been created in form and design which will serve as a constant inspiration to the pupils of the school and a valued possession of the citizens of the community.

The original units of the school were erected in 1925, at an approximate cost of $312,000. The final units were planned in 1931, and contracts were let in January, 1932. West Chester County is the most expensive suburban territory in the United States and prices are as high or higher than those in New York City. Including the foundation work, the additions cost $887,000. The total structure has a cubage of 2,325,000 cubic feet, and cost complete 48½ cents a cubic foot.

THE LAWS GOVERNING THE MAKING OF CONTRACTS FOR THE CONSTRUCTION OF SCHOOL BUILDINGS

(Concluded from Page 41)

ners v. *City of Lowell*[19] is a case in point. A city contracted for the construction of a school building with a contractor, Walker, after rejecting the single bid, which was made by Walker, based on specifications set forth by them in an advertisement for bids. The building was constructed at a cost of about one and a half million dollars. After the completion of the building and some two and a half years after work on it was begun, suit was brought by taxpayers to restrain the making of payments under the contract. The court held that the contract was *ultra vires* the statutory power of the city, but that since they knew about the time that the contract was made that the statute requiring publication of notice had not been complied with, but took no action for over two years, the taxpayers were guilty of *laches*, or unreasonable delay in the enforcement of their rights, and therefore had forfeited their claim to equitable relief. Such cases as this one show that, while the courts are ever mindful of the public good, the public must show a reasonable interest in its own welfare to benefit from the protection of the courts.

[19] *Conners* v. *City of Lowell*, 140 N. E. 742, 246 Mass. 279.

TEACHERS' SALARIES

♦ Palestine, Tex. The salaries of teachers were reduced last year in percentages, ranging from 2½ per cent for the lowest, to 10 per cent for the highest. The salaries of those in the lower group were restored this year, and increases of 5 per cent were given to other teachers. The increases were limited to teachers who had completed the necessary requirements for college degrees.

♦ Fresno, Calif. The school board has voted to reduce the 20 per cent cut in school employees' salaries to 10 per cent. The board has conformed to the NRA by setting the hours of janitors, mechanics, and laborers at 44, and of clerical workers at 40. This has resulted in placing on the payrolls of the school district a number of unemployed workers.

♦ Unemployed teachers of Montana and jobless adults who are capable of teaching have been assured of positions, under the federal employment program. State Supt. Elizabeth Ireland has indicated that a program has been arranged which will provide for additional rural schools, additional classes for illiterates, adults, vocational education, rehabilitation, and general adult education. Teachers who hold certificates, or adults who are capable of teaching but who are not certificated, and are unemployed, will be given employment.

♦ Wisconsin rural teachers are serving the state for an average annual salary of $680, according to data recently compiled by the Wisconsin Teachers' Association, as a result of a questionnaire studying 41 counties of the state. The survey emphasized the fact that the average yearly salary of Wisconsin rural teachers is 6.6 per cent less than the minimum annual salary of $728 guaranteed every full-time worker under the NRA. It was proved that rural teachers have never received a salary in line with that of workers in the industries.

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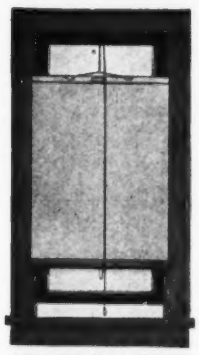

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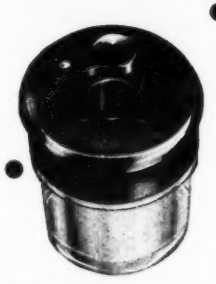

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BOARDS OF EDUCATION

♦ Kent, Ohio. It is expected that the public schools will be operated for the full term of nine months this year. Funds will be available to meet the teachers' payroll and the operating expenses and bond-interest payments.

The school-tax rate has been reduced by five tenths of a mill, due to careful planning and foresight on the part of the school board and Supt. W. A. Walls. The personnel of the schools was cut 16 per cent this year, and all salaries were reduced 14½ per cent. The reductions were effected in order to meet a reduced income caused by a 20-per-cent reduction in real-estate valuations.

♦ Wakefield, Mass. The school board has adopted a new schedule of charges for the use of the school auditoriums. The rental fee for the high-school auditorium has been increased to $15 for use until 10:30, and to $20 after that hour. The fees for the elementary-school auditoriums range from $7.50 to $12.50. A flat fee of $7.50 was made for rehearsals at the high school, and $4 to $5 at the other auditoriums. Janitor service is extra in all buildings and is at the rate of $1 an hour, payable to the janitor.

♦ Quincy, Mass. At a meeting of the school board, Mr. Joseph J. Kendrick, a member, proposed the creation of a business manager's position in the school department. The proposal came as a result of an inquiry by the superintendent of schools if it were the desire of the school board to have a department head at $18 or $20 a day running around town, trying to save money buying secondhand equipment for the commercial department. The controversy had centered on the matter of obtaining the best prices for school supplies and the superintendent challenged a board member to obtain better or cheaper supplies than those obtained this year.

♦ Cambridge, Mass. The school board has approved a program of Supt. M. E. Fitzgerald, providing for a ten weeks' evening-school program and additional school classes. Application has been made to the civil works administration for funds to finance the school.

♦ Madison, Wis. Upon the recommendation of Supt. R. W. Bardwell, the school board has approved a program for establishing four recreation centers and has made application for funds to be secured from the Civil Works Administration.

♦ Des Moines, Iowa. The operation of the Beatty-Bennett law exemption granted to the school district has permitted the operation of the schools for a full school year, on the basis of the present staff and service. Under the exemption, the school board is permitted to levy $79 per pupil instead of $68 as provided by the law, and it has allowed the elimination of the five weeks' extra midwinter vacation period. No additional members of the school staff and no additional services of any kind are contemplated.

♦ Madison, Wis. Prof. E. B. Skinner, a former president of the board of education, speaking recently before a parent-teacher association group, urged that a sharp line be drawn between the powers of the board of education and those of the city council. He described the three types of school government, citing their advantages, and method of election of the school board. He urged that the school code be revised in order to place the control of school funds in the hands of the school board, instead of the city treasurer, as at present.

♦ Palestine, Tex. The school board has voted to restore the budget allowances for instructional supplies, operation, and maintenance. Through an arrangement with the school depository, all salaries and bills were paid promptly.

♦ Tulsa, Okla. The school board has given warning that it will start court action if the county excise board carries out its proposal to cut $215,921 from the school-district budget to bring it within a levy of 3.875 mills. The school board has asked for $1,872,463 in its 1934 budget, and the excise board's proposals would cut this amount to $1,656,541.

♦ Waterbury, Conn. The school board was able to complete the school year 1933 without a deficit, despite the fact that its budget had been severely cut. The financial situation was attributed to numerous economies effected, largely through the combining of classes and the reduction of the teaching staff.

♦ Ansonia, Conn. The new 1934 budget of the school board provides for the restoration of 8 per cent of the 18 per cent deduction made in 1933 from teachers' and school employees' salaries. Practically every item of school expense was cut to restore a portion of the salary deductions.

♦ State aid to New York state schools must be continued and even increased, if educational opportunities throughout the state are to be kept at a satisfactory level, according to Charles C. Burlingham, head of the governor's committee on the study of school costs. A majority of the committee appears to be in favor of restoring state aid to the full statutory amount provided by the original Friedsam law, and rescinding the cut of 10 per cent voted by the legislature two years ago and continued since that time.

While state aid is needed to keep education at a reasonable standard in all districts of the state, it is essential in the poorer districts, according to the Burlingham committee. The report made it clear that any drastic reduction in state aid, or even the continuance of the arbitrary 10-per-cent cut, would lead to a breakdown of the schools in some sections of the state.

Commenting on future needs of the schools, the report points out that the year 1934–35 will see another large increase in pupils, particularly in the high and technical schools, owing to unemployment and the operation of codes. It will also see continued reduction in local assessments. These changes will further increase the disparities in the distribution of state funds, if state aid is to be "pegged" at the amount fixed for the current year.

The committee, in recommending action at the hands of the incoming legislature, asked for the following changes:

1. The greatest of all long-term economies would be the redistricting of the State. Units of attendance, administration, and taxation should be sufficiently large to elminate small expensive classes and make possible efficient professional and business administration. In many upstate counties the number of district superintendents could be greatly reduced, effecting a considerable saving through concentration and efficiency in administration.

2. The education law should be recodified. Unnecessary expenditure often results from the difficulty of understanding and interpreting obscure and conflicting laws.

3. School boards pay large sums for interest charges on money borrowed in anticipation of taxes and State grants. A real economy could be effected if the collection of taxes and the dating of payments of grants from the State were better adjusted to the needs of the schools.

4. It would be a considerable saving to local school boards if they could place their insurance with the State.

♦ Elba, Ala. The financial problem has been a serious one in all school systems, particularly in the smaller towns. The local school system operated its high school the full term of nine months during the past year by means of tuition fees collected during the last semester. The grade schools were operated for seven months. The teachers received 60 per cent of the highest salary they had ever been paid. Last spring, the teachers were reëlected, with a guarantee of receiving as much salary this year, which is 60 per cent of their salary. To date, the teachers have been paid 75 per cent of their salary and have received reasonable assurance that both systems will be operated the full nine months upon this basis.

♦ Boulder, Colo. The school board has adopted a budget of $200,812 for the school year 1933–34. It was voted to increase the school-tax levy from 14.5 to 16.5 mills, which will raise $144,500.

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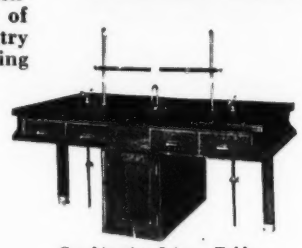

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THE SCHOOL ASPECTS OF PUBLIC WORKS ADMINISTRATION

(Concluded from Page 15)

into this tremendous experiment with much concern and trepidation. It represented such a departure from the established order of things in the past that we found it difficult to comprehend its great virtues. We were concerned with trivial criticisms and objections: we could not see how it would work; we would not let our reactionary minds conceive its rapid acceptance by the people; in fact, we were trying to find reasons why it was all wrong instead of accepting its tenets and trying to benefit from its activities.

Of the original $3,300,000,000 appropriated by Congress in June under the National Recovery Act, $2,653,486,984 has already been allotted as of November 12, leaving an amount of $646,513,016 still remaining. Of the amount above indicated, $2,208,624,811 has been allotted for federal projects and $444,862,173 for nonfederal projects. It is reasonable to assume, in fact, Administrator Ickes has so indicated, that the unallotted balance still remaining will be devoted mainly to nonfederal projects. It is expected that complete allotment of present funds will be made by December 31, 1933.

As of November 12, there were 1,300 nonfederal applications for loans and grants in the Washington headquarters of the PWA pending action. PWA staffs have been working day and night in order to get as many allotments authorized as possible. An average of 300 applications are being received weekly from State Advisory Boards.

It is fairly certain that the administration will request Congress when it convenes in January to add at least $2,000,000,000 to the funds of the PWA to continue its activities when present funds have been completely allotted. Consensus of opinion indicates that Congress will favorably consider the administration's request so that all applications worthy of approval will be taken care of in due course. Do not become unduly alarmed because an application in which you or any of your patrons are interested has not as yet been accepted.

If justifiable in its nature and qualified as to requirements, it will, no doubt, be given favorable consideration. This does not mean that every application will be accepted. Many are unjustified and the borrowing applicant not qualified for a loan or grant, but there are sufficient that are so qualified that it will create a volume of business in all sections of the country that should be gratifying to the severest of skeptics.

It is most gratifying to note that in recent elections throughout the country where voters were asked to approve construction of school buildings, the majority of instances reflected a hearty approval of voters and taxpayers. To those school boards who have hesitated to speculate on the attitude of the public toward new school-building construction, we commend that the recent demeanor of the voting public is favorable for such projects which have apparent worth and justification.

The following memoranda may prove helpful:

1. Actual allotments are made by the PWA in Washington through the office of the Federal Administrator of PWA, Secretary of Interior Harold E. Ickes. Information of allotments from other sources are unreliable and inaccurate. The only place definite loans and grants are made is from the above office.

2. State advisory boards of each state and state engineers have been appointed to properly prepare and to forward to Washington headquarters applications from municipalities in their states.

The school board making application shall have all of its dealings with the members of the state advisory board and state engineer and not with the PWA in Washington until such time as the application is formally forwarded to Washington by the state advisory board.

Do not under any circumstances forward application to Washington direct. It will be promptly returned. Do not hesitate to freely consult state-advisory-board members or state engineers for advice, suggestions, requirements, etc.

3. The functions of the state advisory boards are not to make allotments but are merely the clearing houses of the applications arising in the various states.

The fact that an application has been forwarded by the state advisory board to Washington is not any assurance that loan or grant will be made. It is merely evidence that the application is on its proper way for consideration.

If, after an application has been forwarded to Washington by the state advisory board it is desired by the applicant to further prosecute his application, there appears no good reason why accredited representatives of the school boards should not go to headquarters and discuss with those reviewing their applications, the merits of their cause for favorable consideration.

4. View the PWA as a huge bond house from whom you are asking a loan to erect your project. You must expect that when you wish to borrow money, the lender is entitled to know your exact financial condition, your income, your prospect, your present debts and many items that are essential so that intelligent disposition can be made of your application for the loan.

Do not become irked because the lender asks questions which you think are unessential. Do not forget the lender in this case is considering applications for loans all over the country and is loaning public funds. He, therefore, must be most careful and exacting. Be tolerant of requirements for which you do not see any good reason to comply. Answer them to the best of your ability.

Do not take for granted that the PWA is aware of the great need of your project. It is incumbent upon you to so array your brief or description of the social need of your project that PWA can become convinced accordingly.

5. In order to be in a position to receive immediate consideration for your application, make sure that you have complied with the regular and customary requirements necessary for construction of school buildings in your particular state. Such requirements as selection of architect and preparation of plans are essential. (The state engineer can advise you to what extent plans and specifications are required with your application.)

Approval of state board of education or board of regents if that is a requirement of your state, legal authorization of the required body to enter into a bond issue, be that body the voters of the community, board of estimate, board of aldermen, council, commissioners, or a majority vote of the board of education itself — whatever applies by law.

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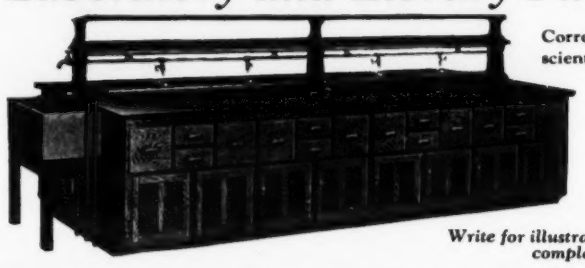

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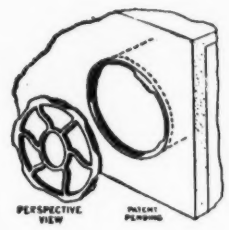

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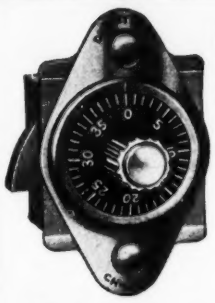

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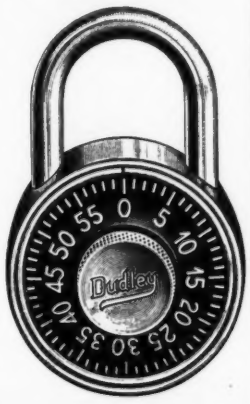

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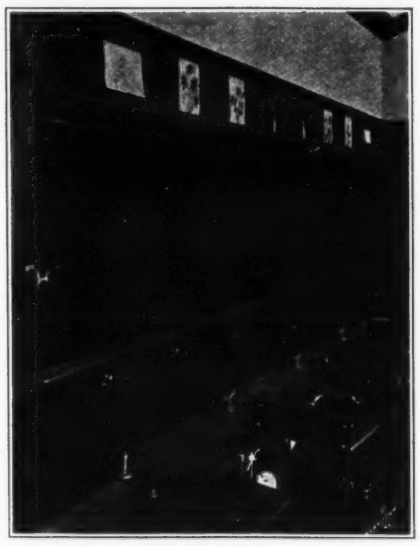

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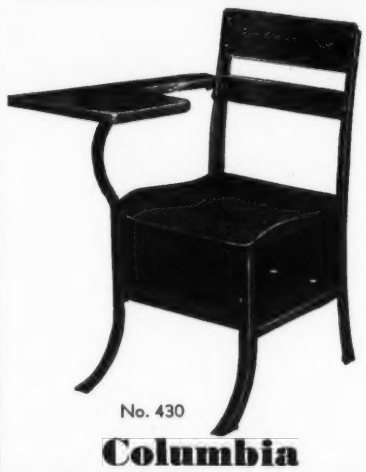

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FINANCE

♦ Pasadena, Calif. The school board has received a report, showing that during the five-year period which has elapsed since 1929, the assessed valuation per pupil in average daily attendance in elementary schools has been reduced from $14,930 per pupil to $9,816 per pupil. In the secondary schools, the assessed valuation has been reduced from $35,842 to $20,289 per pupil. During the same period, the tax roll for schools has been reduced from $1.316 to $1.08 per $100 of assessed valuation.

♦ Fond du Lac, Wis. The city council has approved the school budget for the year 1934. An attempt to effect a reduction of the budget through salary reductions was blocked by the board. It was shown that education costs have increased the least among city departments. The cost of general government between 1920 and 1931 rose 74.4 per cent, protection of person and property 114.5 per cent, while education costs went up only 66.7 per cent during the same period.

♦ Des Moines, Iowa. Craig T. Wright, president of the school board, recently issued a statement, explaining the need for a revision of the school levies in order to keep the schools open through the winter months. He declared that the school budget has been cut $539,000 since 1930 and there appears a real need for financial relief at the hands of the state government. Local business and professional men have joined the board of education in urging upon the legislature a modification of the Beatty-Bennett law along the general lines of the proposed amendment prepared and sponsored by the legislative committee of the state teachers' association.

♦ The public schools of California are anticipating the receipt of additional funds through the proceeds of a new sales tax for state support of the schools.

♦ Claremont, Calif. The financial affairs of the public schools are in excellent condition at the present time. The amount of the tax delinquency during the past year was less than 4 per cent.

♦ New Bedford, Mass. The school board has received a tentative school budget for 1934, calling for expenditures of $1,283,345 for the school year, as compared with an estimate of $1,200,000 for the year 1933.

♦ Cleveland, Ohio. The bonded indebtedness of the public schools has been reduced to $20,000,000 according to G. A. Gesell, clerk-treasurer. This represents a decrease of $8,000,000 during the depression years and a drop of $13,000,000 in nine years. The amount to be paid off in the next few years will depend in large measure upon the taxes approved by the state legislature to make up the revenue lost through a cut in the revenue.

SOUTH DAKOTA SCHOOL BOARDS HOLD MEETING AT SIOUX FALLS

The "warrant monster" is the most dangerous and perplexing financial problem immediately confronting education in South Dakota and other states which face a similar difficult situation in providing funds to pay teachers' salaries, I. D. Weeks, State Superintendent of Public Instruction, told a group of school-board members which met at Sioux Falls, November 26 to 29, in conjuction with the fifty-first annual convention of the South Dakota Education Association.

"Approximately one half of the 3,430 different school districts are registering warrants in South Dakota," State Superintendent Weeks said. "These districts are behind in the redemption of their warrants, ranging from a few months to several years, and one district is reported to be eleven years in arrears. Most of the districts in one county have registered warrants since 1910, or since the time that the county was organized." He continued by stating that a survey of 64 South Dakota counties showed that more that $3,750,000 is now outstanding in warrants, and that the situation has now reached a point where banks will no longer cash warrants. A few corporations and individuals are purchasing these but are demanding a discount of from 2 to 40 per cent. Even coal dealers have refused to accept warrants in payment for fuel.

"Frankly, I do not see any bright future for education in this state unless some constructive plan of action extending over a period of time be inaugurated," the superintendent said. "The time has arrived when we must act. The school people of the state have no pet hobbies to put over. It is rather a matter of working unitedly for a more intelligent and effective program for the education of the youth of this commonwealth."

The superintendent explained that the financial problem is not a question of more money for education, but rather a question of enlarging the spread of the financial load. He suggested enlargement of the taxing units, the grouping of children in several rural districts into one school, and making the state, not the local districts, the unit for the payment of high-school tuition.

In this respect, State Superintendent Weeks declared that under the state constitution, it is obligatory that the state contribute to the maintenance of an educational system, and he pointed out that during the state's entire history this constitutional provision has been ignored until the gross-income-tax law was passed by the 1933 legislature last January. This law provides that 45 per cent of the total amount collected shall be allotted to indigent schools in the state.

Through this source of revenue South Dakota educational interests vision a substantial aid in providing funds for school districts, which previously have been unable to obtain sufficient money in their own locality to continue the operation of schools in their districts. The new gross-income-tax law became effective July 1, 1933, and as a result it cannot be determined at this early date just how much money it will provide. However, when the bill was passed by the legislature, its sponsors declared that it would raise approximately $10,000,000. One half of the amount is to replace real-property-tax levies made by the state, and 45 per cent is to go into the school fund, the remainder being used for administration costs.

Superintendent Weeks took occasion to criticize the action of the last national congress for its failure to provide relief funds for distressed schools throughout the nation. He charged that railroad and insurance companies were able to obtain large loans from the Reconstruction Finance Corporation, while the states were unable to obtain money to provide relief for their school systems, particularly the payment of teachers' salaries.

"However, there may be some hope for relief after January 1, when the new banking laws become effective," Superintendent Weeks said, and he pointed out that assurance had been given at Washington that if material aid was not provided under this plan through the banks of the nation, steps would be taken by the Federal Government to furnish money to relieve the distressed schools in South Dakota, as well as other states, which have faced similar conditions. Superintendent Weeks's address was given before a meeting of the School Boards Section of the South Dakota Education Association.

Dr. C. A. Prosser, president of Dunwoody Institute at Minneapolis, also addressed the Department, speaking on the subject, "The Coming High School," in which he portrayed a drastic change in the curriculum. This change would eliminate a number of the subjects which he deemed as unessential, and the introduction of subjects of more practical value.

The election of officers for the School Board Section resulted in the reëlection of the following who had held office the past year: I. J. Bibby, Brookings, president; O. M. Tiffany, Aberdeen, vice-president; C. A. Hamilton, Sioux Falls, secretary-treasurer.

PERSONAL NEWS

● Supt. D. T. Delmet, of Norwalk, Calif., has been re-elected for a four-year term.

● Mr. Herald Hunt, of St. Johns, Mich., has accepted the superintendency at Kalamazoo.

● Mr. R. E. Balliette, of Antigo, Wis., has been elected superintendent of schools at Platteville.

● Mr. Martin Koons, secretary of the school board of New Castle, Ind., died at his home on December 14, following an illness of several months. He was completing his sixth term as a member of the board.

● Mr. G. J. Provo, president of the board of education of East Cleveland, Ohio, is this year completing sixteen years of active service on the board.

● Mr. Felix E. Miller, a pioneer school-board member, died at Memphis, Tenn., on December 8. Mr. Miller served on the Shelby County board of education for twelve years, most of his service being given as chairman of the board.

● Mrs. Mary M. Hooker was recently reëlected as president of the board of education of Hartford, Conn. Frank Covello was reëlected vice-president.

● Mr. E. L. Hettinger has been elected president of the board of education at Reading, Pa.

● Dr. C. W. Vates has been reëlected president of the board of education of Mt. Oliver, Pa.

● Alois A. Kaufmann, formerly chief deputy in the office of the clerk of the district court at Dubuque, Iowa, has been elected secretary of the city board of education. Mr. Kaufmann, who succeeds Peter Nicks, is a graduate of Columbia College and has been chief deputy for ten years.

● The school board of Owensboro, Ky., has reorganized for the next year, with the election of four new members, to replace the four retiring members, who had been members of the board for from twelve to fourteen years. The new members comprise Mr. R. S. Triplett, Mr. O. N. Magruder, Mr. W. J. Simpson, and Mrs. Delbert J. Glenn.

After the Meeting

Hell hath no fury like a professor whose theories are disturbed. — Rexford G. Tugwell.

They Are That!

"Can any of you," the teacher asked, "tell me what 'amphibious' means, and give a sentence to illustrate?"

A bright little Negro held up his hand. "I know, sah! It's fibbing. Mos' fish stories am fibious!" — Boston Transcript.

High Finance

"You haven't got the answer to this problem right," said the teacher, at the close of school. "You'll have to stay and do it over."

"How far off is it this time?" asked the boy in despair.

"Two cents."

"Well, I've got something awful important to do after school. I'll just pay the difference." — Exchange.

Entitled to Discount

Mrs. Brown: "Don't you think, doctor, you rather overcharged when Johnny had the measles?"

Doctor: "You must remember, Mrs. Brown, that includes twenty-two visits."

Mrs. Brown: "Yes, but you forget that he infected the whole school."

Did You Ever

Teacher: "Give an illustration of great will power."

Billy Brown: "To refrain from using imaginary brakes when my sister is driving the car."

Comparatively Speaking

Teacher: "Give me the comparative and superlative degrees of sick."

Willie: "Sick, sicker, dead!"

Teacher Was Incorrect

Teacher: "Correct this sentence: 'It was me that spilled the ink.'"

Pupil: "It wasn't me that spilled the ink."

Synonyms

A Wichita (Kans.) woman called at a local bookstore the other day, and asked for a "book of cinnamons," which her daughter required for her schoolwork. — Wichita Eagle.

Logical

Teacher: "Johnny, what is a cannibal?"

Johnny: "I don't know."

Teacher: "Well, if you ate your father and mother, what would you be?"

Johnny: "An orphan."

JAMES W. SHERMAN TAKES NEW POSITION

Mr. James W. Sherman, who recently became manager of the educational department of Little, Brown & Company, has been associated with the department for twelve years.

MR. JAMES W. SHERMAN
Manager, Educational Department,
Little, Brown and Company,
Boston, Massachusetts.

After graduating from Harvard University in 1920, he entered the employ of the publishing firm of Small, Maynard & Company, of Boston.

In 1921, he resigned to become associated with the educational department of Little, Brown & Company in Boston, where he had remained for the past twelve years.

E. M. BROWN DIES IN ST. LOUIS

Edmund M. Brown, for 24 years supply commissioner for the board of education of St. Louis, Mo., died at his home in Clayton, on December 3, following a long illness of heart disease. Mr. Brown suffered a serious case of pneumonia four years ago, which developed into the heart ailment. He had not been able to be on active duty at his office since last April.

Born and educated in Philadelphia, Mr. Brown went to St. Louis as a young man, entering the wholesale grocery business. He was a salesman for years, and then

THE LATE MR. E. M. BROWN

sold woodenware to the St. Louis wholesale trade, before entering the school board's employ.

Mr. Brown was largely responsible for the organization and development of the school-supply department which had been established in 1897, when the school system was reorganized. Under his direction it reached its present high standard and has achieved national recognition as a model for educational service. The St. Louis school-supply department handles a wide variety of items, ranging from desks to brooms. It also conducts lunchrooms for pupils in high and other schools, and operates a successful book bindery and shops for the repair and maintenance of equipment.

Mr. Brown was reëlected to a four-year term last June. In 1926 he was president of the National Association of Public-School Business Officials.

Mr. Brown is survived by his widow and four children of a former marriage.

Buyers' News

New School Telephones Announced. The Automatic Electric Company, 1033 E. Van Buren St., Chicago, Ill., has announced a new line of small "common talking" school telephone systems.

These new telephones are of the most convenient type, with each telephone combining the push buttons and signal in a single, compact instrument. The firm manufactures a complete line of telephone systems, comprising selective ringing systems of six- and ten-

THE NEW AUTOMATIC SCHOOL TELEPHONES ARE STURDY AND DEPENDABLE

station capacities, as well as two master station systems having capacities of 10 and 100 outlying telephones. The master station includes a small, compact desk box, with ten telephone switchboard-type keys. The attendant at the master station can easily signal any outlying station by the manipulation of any of these keys. Various types of wall telephones are also manufactured by this firm.

Complete information and prices may be obtained by any school official upon request.

R-C-A Centralized Public-Address Systems. The R-C-A Victor Company, Inc., Camden, N. J., has issued an interesting booklet, describing and illustrating some of the standard productions of the R-C-A Victor Company for meeting all of the requirements of sound reproduction.

The booklet lists and describes centralized radio systems, public-address systems, antenaplex systems, and paging systems. The booklet is issued in loose-leaf form, permitting the addition of new items as they are issued.

Complete information and prices are available upon request.

New Humidity Controls. The new humidity controls, just placed on the market by the Minneapolis-Honeywell Regulator Company, Minneapolis, Minn., are the result of long and intensive study on the part of the firm's research department.

The humidity controls are built in various models, providing for different electrical circuits and are available with or without relative humidity indicators. The new line offers accuracy and sensitivity in the control of humidity not previously available in units suited to domestic or small commercial installations.

THE NEW MINNEAPOLIS-HONEYWELL HUMIDITY CONTROL FOR SCHOOLS

The device is composed of a hygroscopic element, with multiple groups of human hair, and a simple lever mechanism for transmitting the motion of the contracting element to the mercury switch. Ample electrical capacity is available for the direct control of line voltage solenoid water valves or small motors.

The device is designed to meet the needs of room control of humidity and is arranged to provide accurate control and to perform successfully over long periods of time. The controls are capable of operating under conditions of normal rate of increase or decrease in relative humidity control within a total variation of two per cent.

The Norton Alundum Abrasive. The Norton Company, Worcester, Mass., has issued an interesting 24-page booklet, entitled *The Technical Aspect of Polishing Grain,* in which it describes in story and picture the use of Norton alundum abrasive for polishing purposes.

Alundum abrasive is a mineral bauxite which is fused in an electric furnace, purified, crystallized, and converted into small grains for polishing and grinding operations. The product is the result of many years of research, and its main characteristics are hardness and toughness which make it valuable for use in the working of iron and steel.

Garrison Fire-Detecting System. The Garrison Fire Detecting System, Inc., 307 Fifth Ave., New York City, has perfected and placed on the market its automatic fire-detecting and exit-control system.

The system maintains direct control with the fire department, provides for automatic detection of the fire, automatic calling of the fire department, warning signal, automatic designation of safe exits and exit routes, and announcement of the zone location by suitable visual signals on the main control panel. It may be used for fire drills, without the calling of the fire department, by using the key-type test stations, located one in each zone. A system of loud-speakers gives the warning signal, and the spoken instructions for beginning the exit march.

Complete information may be obtained by any school official upon request.

New PX Bookbinding Material. The E. I. duPont deNemours Company, Newburgh, N. Y., has placed on the market its PX cloth for use in binding school textbooks. The new bookbinding material is the result of years of research and is the practical application of a new product. Its introduction means its gradual infiltration into the fields of its chosen service, particularly in the school field.

The new PX cloth has been subjected to a number of rigorous tests to determine its ability to withstand cracking, breaking down, and susceptibility to the ravages of book vermin. It is a natural development from the Fabrikoid and has the wearing, waterproof, and verminproof properties of that material, without its weight.

Complete information concerning this new material will be sent to any school official upon request.

Sale of Schoolbooks and Supplies

There appeared in the December number of this publication an editorial which stated that the board of education of Madison, Wisconsin, had decreed that schoolbooks shall be bought from the local dealers

Supt. R. W. Bardwell now explains that this statement was not entirely correct. The five local dealers employed an attorney to prevent the issue of the private and public sale of schoolbooks to the board of education. The board after granting a hearing determined that the purchase of books and supplies for the schools involved both a convenience and a saving. In brief, the petition of the local dealers was denied.

The "REGULAR" School Trade Directory

ACOUSTICAL TREATMENT
Armstrong Cork & Insulation Co.
Cabot, Inc., Samuel
Celotex Company, The
ARCHITECTS
(See Architects Directory, page 6)
AUDITORIUM SEATING
American Seating Company
Heywood-Wakefield Company
Irwin Seating Company
National School Equipment Co.
Peabody Seating Company, The
AUTOMATIC TELEPHONE SYSTEMS
American Automatic Electric Sales Co.
Graybar Electric Co., Inc.
Western Electric Company
BLACKBOARD CLEANERS
Huntington Laboratories
Palmer Products, Inc., The
Vestal Chemical Company
BLACKBOARDS—COMPOSITION
Beckley-Cardy Company
BLEACHERS
Newcastle Products, Inc.
Wayne Iron Works
BOILER COMPOUNDS
Huntington Laboratories
Palmer Products, Inc., The
Vestal Chemical Company
BOOK CASES
Kewaunee Mfg. Company
Kimball Company, W. W.
Peterson & Co., Leonard
BOOK COVER MATERIAL
DuPont de Nemours & Co., E. I.
BOOK COVERS
Holden Patent Book Cover Co.
BRUSHES—FLOOR
Continental Car-Na-Var Corp.
Huntington Laboratories
Palmer Products, Inc., The
Vestal Chemical Company
BULLETIN BOARDS
Kewaunee Mfg. Company
CAFETERIA EQUIPMENT
Blickman, Inc., S.
Kewaunee Mfg. Company
CHAIRS
American Seating Company
Heywood-Wakefield Company
Irwin Seating Company
National School Equipment Co.
Peabody Seating Company, The
CHALK
Binney & Smith Company
CLASSROOM TEACHING FILMS
Eastman Teaching Films, Inc.
CLEANING SUPPLIES
Finnell System, Inc.
Ford Company, The J. B.
Huntington Laboratories
Palmer Products, Inc., The
Vestal Chemical Company
CLOCKS—PROGRAM
International Business Machines Corp.
Standard Electric Time Co.
CIRCUIT ELECTRICAL DISTR. SYSTEM
Knapp Brothers Mfg. Co.
CORK TILE & CORK CARPET
Armstrong Cork & Insulation Co.
Congoleum-Nairn, Inc.
CORNER BEADS
Knapp Brothers Mfg. Co.
CRAYONS
Binney & Smith Company
DAMPPROOFING COMPOUNDS
Sonneborn Sons, L.
DEADENING QUILT
Armstrong Cork & Insulation Co.
Cabot, Inc., Samuel
Celotex Company, The
DETERGENTS
Ford Company, The J. B.
DISHWASHING COMPOUNDS
Ford Company, The J. B.
Huntington Laboratories
Vestal Chemical Company
DISINFECTANTS
Huntington Laboratories
Palmer Products, Inc., The
Vestal Chemical Company
DOMESTIC SCIENCE FURNITURE
Kewaunee Mfg. Company
Kimball Company, W. W.
Peterson & Co., Leonard
DRAFTING ROOM FURNITURE
Kewaunee Mfg. Company
Kimball Co., W. W.
Peterson & Co., Leonard
DRINKING FOUNTAINS
Rundle-Spence Mfg. Co.
Taylor Company, Halsey W.
DUPLICATING MACHINES
Ditto, Inc.
ELECTRICAL EQUIPMENT
Westinghouse Elec. & Mfg. Co.
EMERGENCY LIGHTING
Electric Storage Battery Co.
ENGRAVERS
Premier Engraving Co.
ERASER CLEANERS
Palmer Products, Inc., The
ERASERS
Beckley-Cardy Company
Palmer Products, Inc., The
EXIDE BATTERIES
Electric Storage Battery Co.
FENCES—IRON
Cyclone Fence Company
Stewart Iron Works Co., The
Wayne Iron Works
FIRE ALARM SYSTEMS
Garrison Fire Detecting Systems
International Business Machines Corp.
Standard Electric Time Co., The
FIRE EXIT LATCHES
Vonnegut Hardware Co.
FLOOR COVERING
Armstrong Cork & Insulation Co.
Congoleum-Nairn, Inc.
FLOOR FINISHES
Continental Car-Na-Var Corp.
Finnell System, Inc.
Huntington Laboratories
Palmer Products, Inc., The
Sonneborn Sons, L.
Vestal Chemical Company
FLOORING—COMPOSITION
Armstrong Cork & Insulation Co.
Congoleum-Nairn, Inc.
FLOOR SCRUBBING EQUIPMENT
Finnell System, Inc.
Huntington Laboratories
Vestal Chemical Company
FLOOR TILE
Armstrong Cork & Insulation Co.
Congoleum-Nairn, Inc.
Norton Company
FLOOR TREATMENTS & COMPOUNDS
Continental Car-Na-Var Corp.
Finnell System, Inc.
Huntington Laboratories
Palmer Products, Inc., The
Sonneborn Sons, L.
Vestal Chemical Company
FLOOR WAX
Continental Car-Na-Var Corp.
Finnell System, Inc.
Huntington Laboratories
Miracul Wax Company
Palmer Products, Inc., The
Vestal Chemical Company
FLUSH PICTURE MOLDS
Knpp Brothers Mfg. Co.
FOLDING CHAIRS
American Seating Company
Columbia School Supply Co.
Heywood-Wakefield Company
Irwin Seating Company
National School Equipment Co.
Peabody Seating Company
FOLDING PARTITIONS
Newcastle Products, Inc.
FURNITURE—CLASSROOM
American Seating Company
Columbia School Supply Company
Heywood-Wakefield Company
Irwin Seating Company
National School Equipment Co.
Peabody Seating Company, The
GRANDSTANDS
Newcastle Products, Inc.
Wayne Iron Works
GYMNASIUM APPARATUS
Medart Mfg. Co., Fred
HEATING & VENTILATING SYSTEMS
Nesbitt, Inc., John J.
HEAT REGULATOR
Johnson Service Company
Minneapolis-Honeywell Regulator Co.
Powers Regulator Co. n
HUMIDITY CONTROL
Johnson Service Company
Minneapolis-Honeywell Regulator Co.
Powers Regulator Co.
INKWELLS
Babb & Co., Inc., Edward E.
Sengbusch Self-Closing Inkstand Co.
Squires Inkwell Co.
INSULATION
Armstrong Cork & Insulation Co.
Celotex Company, The
INTERIOR TRIM—METAL SANITARY
Knapp Brothers Mfg. Co.
JANITOR'S SUPPLIES
Continental Car-Na-Var Corp.
Finnell System, Inc.
Huntington Laboratories
Palmer Products, Inc., The
Sonneborn Sons, L.
Vestal Chemical Company
KITCHEN EQUIPMENT
Westinghouse Electric & Mfg. Co.
LABORATORY APPARATUS
International Business Machines Corp.
Kewaunee Mfg. Co.
Standard Electric Time Co., The
LABORATORY FURNITURE
Kewaunee Mfg. Company
Kimball Company, W. W.
Peterson & Co., Leonard
LAUNDRY CLEANING SUPPLIES
Ford Company, The J. B.
LIBRARY FURNITURE
Kewaunee Mfg. Company
Kimball Company, W. W.
Peterson & Co., Leonard
LIGHTING EQUIPMENT
Graybar Electric Co., Inc.
Holophane Company, Inc.
Westinghouse Elec. & Mfg. Co.
LIGHTING—EMERGENCY
Electric Storage Battery Co.
LINOLEUM
Congoleum-Nairn, Inc.
LIQUID FLOOR HARDENER
Sonneborn Sons, L.
LIQUID SOAP
Huntington Laboratories
Palmer Products, Inc., The
Vestal Chemical Company
LOCKS—KEYLESS
Dudley Lock Corporation
Kewaunee Mfg. Company
Miller Keyless Lock Co., J. B.
Yale & Towne Mfg. Co.
LOCKERS
Berger Mfg. Company
Medart Mfg. Co., Fred
METAL GROUNDS
Knapp Brothers Mfg. Company
MICROSCOPES
Spencer Lens Company
MOTION PICTURE MACHINES
Eastman Teaching Films, Inc.
ORNAMENTAL MOLDED INTERIOR METAL TRIM
Knapp Brothers Mfg. Co.
PAINTS
Sonneborn Sons, L.
PAPER TOWELS
A. P. W. Paper Company
PENCILS
Reliance Pencil Co.
PIANOS
Kimball Company, W. W.
PLAYGROUND EQUIPMENT
Medart Mfg. Co., Fred
PLUMBING FIXTURES
Rundle-Spence Mfg. Co.
Taylor Company, Halsey W.
POLISHING & WAXING EQUIPMENT
Continental Car-Na-Var Corp.
Finnell System, Inc.
Huntington Laboratories
Vestal Chemical Company
PORTABLE BLEACHERS
Newcastle Products, Inc.
Wayne Iron Works
PORTABLE SCHOOLHOUSES
Newcastle Products, Inc.
PROJECTION LANTERNS
Spencer Lens Company
PROJECTION MACHINES
Eastman Teaching Films, Inc.
PUBLIC ADDRESS SYSTEMS
Graybar Electric Co., Inc.
International Business Machines Corp.
Western Electric Company
PUBLISHERS
Allyn and Bacon
American Book Company
Laidlaw Brothers
Macmillan Co., The
Merriam Co., G. & C.
RANGES—ELECTRIC
Westinghouse Electric & Mfg. Co.
SCISSORS
Acme Shear Company, The
SCREENS—MOTION PICTURE
Eastman Teaching Films, Inc.
SHOWERS
Powers Regulator Company
SOAP DISPENSING EQUIPMENT
Huntington Laboratories
Palmer Products, Inc., The
Vestal Chemical Company
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Tiffin Scenic Studios
Twin City Scenic Co.
STAIR TREADS
Norton Company
STEEL CABINETS
Berger Mfg. Company
Medart Mfg. Co., Fred
STEEL SHELVING
Berger Mfg. Co.
Medart Mfg. Co., Fred
TABLES
Kewaunee Mfg. Company
Kimball Company, W. W.
Peterson & Co., Leonard
TELEPHONE SYSTEMS
American Automatic Electric Sales Co.
Graybar Electric Co., Inc.
International Business Machines Corp.
Standard Electric Time Co., The
Western Electric Company
TEMPERATURE REGULATION
Johnson Service Company
Minneapolis-Honeywell Regulator Co.
Powers Regulator Company
TOILET PAPER AND FIXTURES
A. P. W. Paper Company
Palmer Products, Inc., The
TOWELS
A. P. W. Paper Co.
Palmer Products, Inc., The
VENTILATORS
Knowles Mushroom Vent. Co.
Nesbitt, Inc., John J.
VOCATIONAL FURNITURE
Columbia School Supply Company
Kewaunee Mfg. Company
Kimball Company, W. W.
WARDROBES
Austral Sales Corp.
Evans, W. L.
Newcastle Products, Inc.
Schoolkraft Co.
WASTE PAPER BASKETS
National Vulcanized Fibre Co.
WASTE RECEPTACLES
Solar-Sturges Mfg. Co.
WATER COLORS
Binney & Smith Company
Laidlaw Brothers
WATERPROOFING COMPOUNDS
Sonneborn Sons, L.
WINDOW FIXTURES
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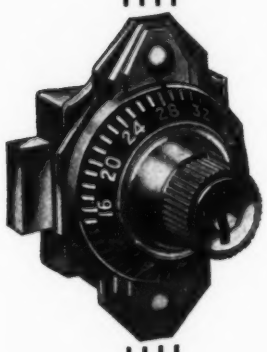

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A remarkably clear and concise statement of the essential principles of grammar—splendid for review purposes for high school students.

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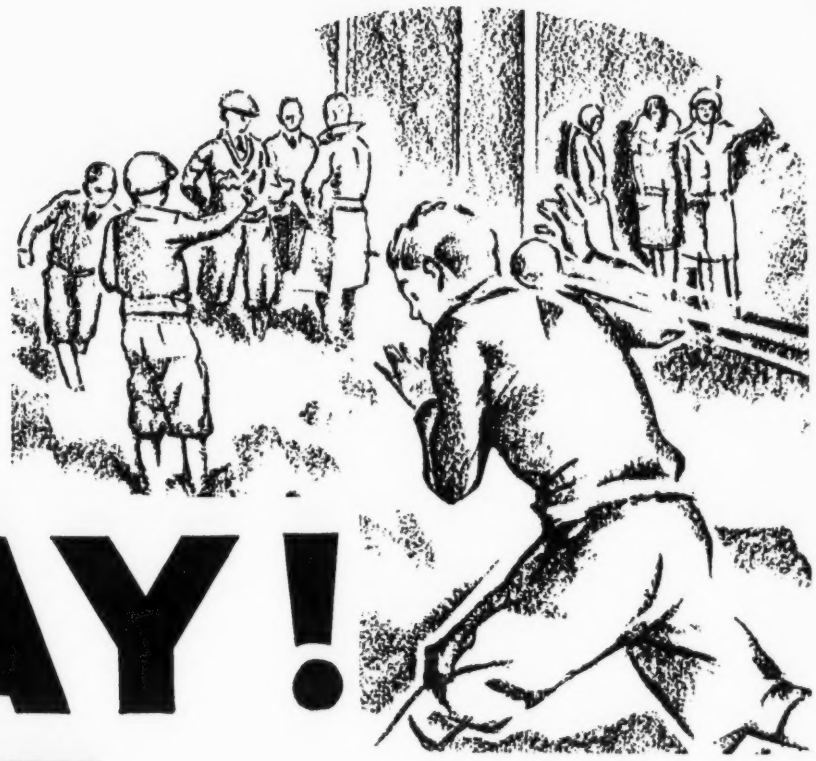

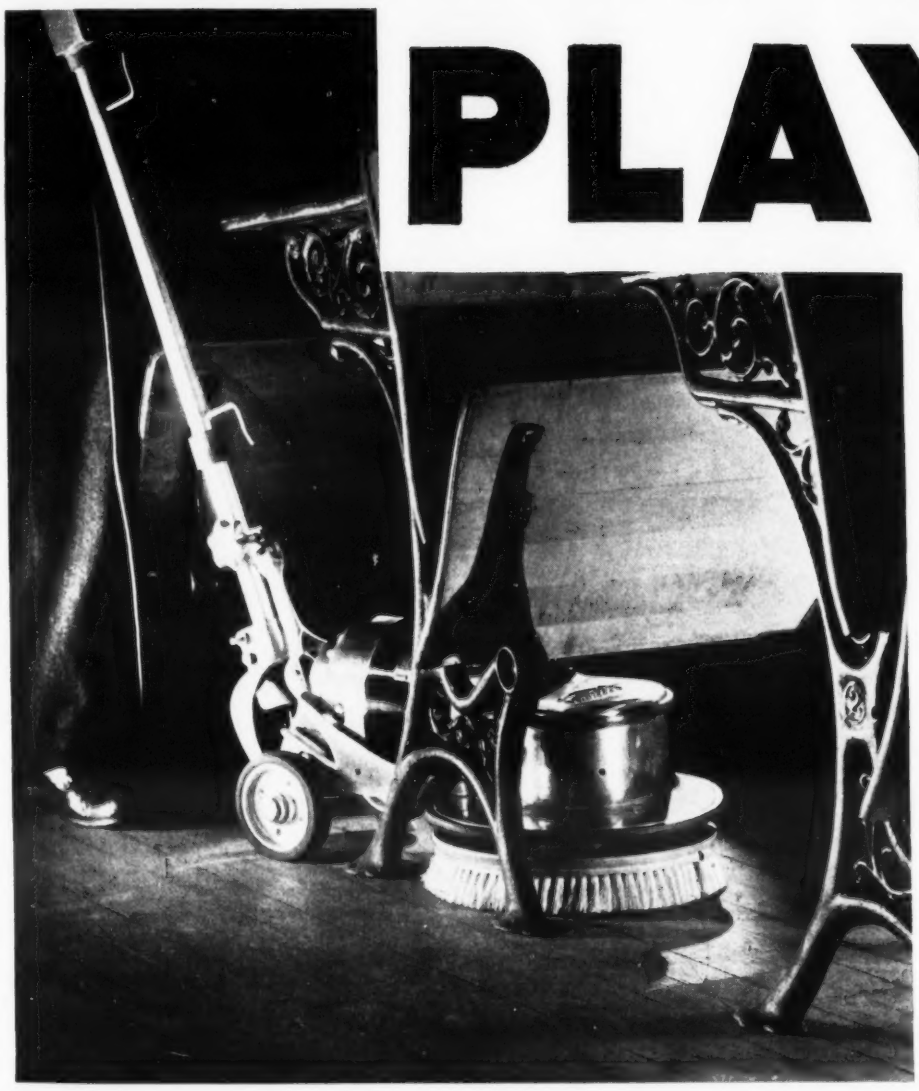

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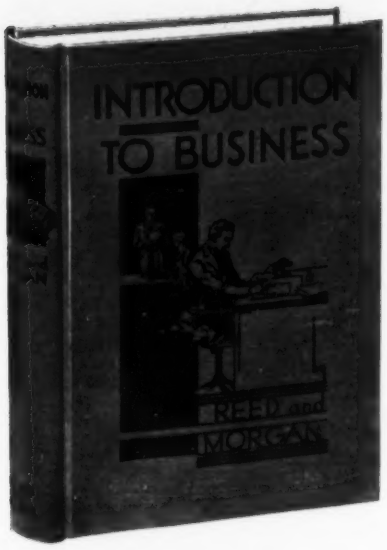

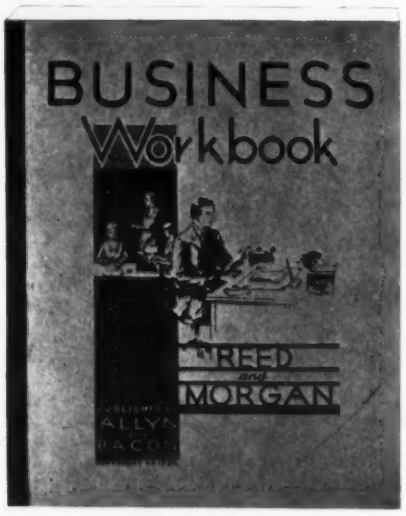

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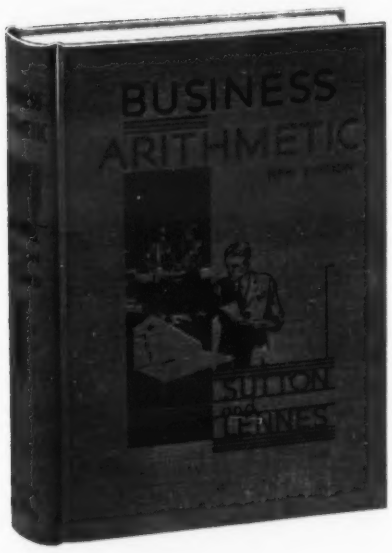

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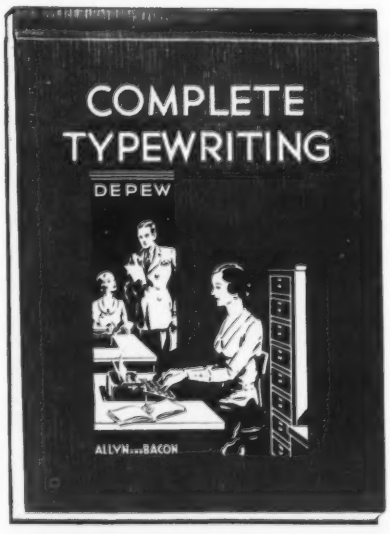

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